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VOL. XVI DECEMBER, 1933 No. 12

THE MEDICAL PROFESSION *VERSUS* RACKETEERING*

His Excellency, John Gregory Murray
Archbishop of the Diocese of Saint Paul

Saint Paul

ESTEEMED Chairman, Members of the Minnesota Medical Association, Ladies and Gentlemen: The atmosphere in which I am privileged to address you this evening is most wholesome to present the thoughts that I have; for this, a great medical center that is unique in history, so far surpasses all the achievements of medical organization in any other time or in any other country that there is only one incident that comes to my mind as I review the pages of history that seems to approach, to some degree, the organization that you have set here in Rochester. That was the famous city of Basil in Syria, which way back in 380 established a center to which the afflicted of every condition, of every race, of every malady and affliction might have recourse in order to find relief.

Surely, it is a wholesome place for us to meet here in Rochester, which has taken the leadership among all the outstanding centers of medical activity in the world.

I come here in a very happy mood because I appreciate the part that is played by the medical profession in advancing the interests of society at large. Sometimes we think that the medical profession is devoted so exclusively to one particular form of activity that it reserves to itself the disposition to isolate itself somewhat from the every-day activities of humankind. But as we go back through the course of history, we find that the medical profession was intimately associated with the constructive program for the advancement of the race, not only in regard to the giving of physical relief but likewise, as my predecessor on this platform has already said, in the development of a mental relief. In fact, all the various activities of life, whether in the intellectual field or in the moral field or in the physical field, are so interdependent that it is almost impossible for any one particular sphere to be fully developed in a wholesame way without the coöperation of all the activities. So that man finds his happiness in possessing a sound mind and a sound body, for the mind, after all, is the source of thought by which he must direct his moral activities, and both mind and morals are so closely associated with a wholesome physical background that all combine to develop the perfect man.

The reason I am concerned with emphasizing a particular phase of the relationship of a medical society to the human race at large in my remarks this evening is because I realize that the medical profession is so close to the mind and the heart of humanity that it occupies a position of great strategy in our present day when there is a tendency to absorb so completely all the activities of the professions as to make them more or less subject to the disposition of modern government, to dictate to the individual as to how he shall live, as to how he shall develop.

You all know that there are two schools in regard to the view concerning government. There is the school that considers that government should be limited as far as possible to that particular sphere wherein it may protect the individual from being hampered in any way in the perfect development of self.

But there is likewise another school that is disposed to be so paternalistic that it assumes the responsibilities for practically all the activities of the human race; so much so that it is pyramiding upon government the functions of the home,

*Presented before the annual meeting of the Minnesota State Medical Association, Rochester, Minn., May 22, 1933.

the functions of the family, the functions of education, the functions of the professions, so that there is scarcely anything left in the way of responsibility or initiative for the individual. It is that particular trend that gives me very much concern at the present time.

You know that the culture of any nation is determined by its standards of living. Its standards of living have to do not simply with the food that a man eats or the house in which he dwells, but especially concerns the particular intellectual point of view that he has attained and the ethical standards he has adopted, because, after all, those spiritual elements to which the recipient of the medal this evening referred are the essential elements in the development of society.

Of course, if there is a tendency on the part of government to suppress initiative, to eliminate practically any personality in the development of the sciences, in the development of the professions, what seems in the beginning to be perhaps an advantage to the greater number, because of a more equitable distribution of the sources of help and the sources of support, in the latter days tends to the annihilation of that particular individual and personal element that is so essential to culture, so essential to the standards of living and so essential to the welfare of any profession.

You know that a profession, in contra-distinction to any other kind of a vocation in life, tends to the enhancement and the enrichment of the values in society at large and it tends to elevate the race, whereas the individual who seeks after the enrichment of self in a material way is concerned only with self.

Now, of course, in every particular field, no matter what the professional field may have been, there has always been the tendency on the part of certain individuals to enrich themselves in a material way at the cost of the entire group.

We find that way back in the earliest days of medical history, when the great father of medicine, Hippocrates, who was named "the Divine" or "the Great" in contradistinction to six others of the same name, finally organized medical science in such a way that it would be built upon the study of the individual; that instead of simply considering the disease, he undertook to consider the entire man.

After all, that particular essential that he incorporated into medical history way back in 560 B. C. has been the one particular element that has been developed to a greater degree in modern medicine. So that men are not so much concerned about discovering the disease by a process of diagnosis, and then applying a specific remedy, as men are concerned about the prognosis of each particular case by a study of the entity, his morals, his resources, his courage, his fortitude, his spirit of perseverance in the face of difficulties, and then to try to consider the particular need in view of all the circumstances that arise in the case.

While Hippocrates was quite successful in developing certain medical principles that were later on incorporated by his followers into a certain code known as "The Aphorisms of Hippocrates," yet there was always, at the same time, in competition with his school, the school of Cnidus; the school that incorporated into its processes those traditions of Egypt and of certain parts of Asia and India, that tend to a schematization or general development of certain ideas rather on speculative grounds, rather on the supposition that certain things should be so a priori, and, therefore, "we will adopt them, no matter what the outcome may be, whether the patient survives or not." The fact is that the philosophical principles behind this particular procedure have been faithfully observed, and the results, as far as the patient is concerned, are altogether secondary. The school and its background have been maintained, but, of course, the patient, after all, only happened to be a victim of circumstances.

There has always been that tendency of a conflict between the recognition of the facts as discovered by personal research and the presupposition as to what should be discovered by a process of reasoning rather than by a process of observation.

Unfortunately, in the course of time, this excellent foundation laid by Hippocrates was so lost sight of that about the second century after Christ, Galen came along with his theories as to the processes that were speculative in nature; his theories were taken up by the school of Arabian medicine to such an extent, that for upwards of one thousand years the school of Arabian medicine dominated all of Europe, because the Arabs had passed over from Asia into Northern Africa and into Spain and had there set up their center of activity in that particular

part of the world. It required the greatest effort on the part of those who recognized the true procedure in medical science to finally reconstruct the Greek principles, especially in the school of medicine at Salerno in the kingdom of Naples way back in the Twelfth Century. It seemed heretical if you did not accept the standards that had prevailed according to the school of Galen.

It was not until the Fifteenth Century, late in the Fifteenth Century and early in the Sixteenth Century, that the development of humanism, especially under Petrarch, gave an opportunity for men to go back to the sources of true medical history in order that men might not be the victims of mere speculation but might become the beneficiaries of actual observation and research as applied to the individual man.

That particular development of modern medicine has led to the marvelous progress that has been made by the science of medicine in these latter years. Surely, there has been no science in all history that has made as rapid progress as medical science in the last four hundred years, but more particularly in the last four or five decades. Why? Because there were men who were actuated by that love of truth and that support of the welfare of the individual who isolated themselves in their laboratories, from the common round of men and women and opportunities for social enjoyment, in order that they might discover even a grain of truth to add to the great mountain, as was so beautifully expressed by him who received the medal tonight in recognition of his work in the laboratory.

I have developed this particular theme at some length in order to emphasize this truth: That if there is not given to the individual physician and surgeon the opportunity to depend upon his own initiative, to develop his own particular field in the spirit of freedom, with the moral support and with the good will of all those who are interested in the progress of science, there will be a reaction that will be most unfavorable just the same as has occurred in the centuries of the past, simply because men began to speculate as to a better process, or a better method, in order to advance public health and to advance the welfare of medical science.

Of course, the most dangerous condition prevailing today is that, instead of having mere quacks to go around and hoodwink unsuspecting, innocent victims, who, because of the limitations of their practical knowledge, are always disposed to look for a remedy everywhere except where it can be found, instead of the individuals being subjected to the evils of quackery, we find that in the whole field of human activity today there is the tendency on the part of an individual to become the leader of a great group, or a great band, and as they prey they do not look simply for an individual but they look for an entire profession. They look for an entire group that has assumed a position of great responsibility in the world or a position that is quite essential to the economic or the social welfare of the world.

We know just what has happened to all of us who are assembled in this hall tonight, on account of the fact that certain salesmen of high pressure resources succeeded in leading all the bankers of this country out of the field in which they should have exercised the functions of trustees of the people's money, into the speculative field in order to use the people's money to make more money, and, of course, what everyone might anticipate has come upon us. Instead of making more money, they have simply wrecked the whole financial structure.

The same thing is true in regard to other fields. At the present time there are those who undertake to set up a certain scheme, we will say, of education that is so contrary to the acknowledged principles of psychology and of ethics that we are in a great field of experimentation which might have been justified when it is a question of a material problem.

But when you come to the consideration of an intellectual, a spiritual problem, it is absolutely necessary that men should recognize the background of philosophy that has been developed during the course of centuries and not entirely discard what has been the result of learning.

Going outside of the field of finance, outside of the field of education, we have this field of government that has undertaken now to take upon itself so much responsibility for the world at large that the individual has no longer any need to use his brains or to use his sense of responsibility to society at large. What will be the result? Simply there will be the same condition, that will be a catastrophe in character, if we permit government to assume all the responsibilities. Government is essentially organized as a police power. That is the essential

function of government. It is not so much to stimulate the individual to take care of himself, as to protect the individual from any particular other individual or group or circumstances or conditions that might hamper the welfare of the individual.

That is the reason, at the various meetings of the Medical Society, ever since its organization some eighty years ago, that the doctors took counsel with each other as to how they might eliminate the menace that came to society and to the individual. They felt they were justified in using the police power, in order to prevent those who were not qualified or were not actuated by proper motives to pursue the study of medicine. Of course, in that the government has a most essential function to perform.

But, instead of continuing in that particular field, we find now that the tendency is for the government to come in and absorb all the activities of society. The government, you know, is nothing more than a combination of individuals. The government, even though it may represent 100,000,000, does not represent any more wisdom that the wisdom of the wisest man in 100,000,000, and the government doesn't represent any more spirit of sympathy and consideration than you find in any of the individuals that are exercising the powers of government.

If you have had any experience at all, you will discover that the tendency on the part of government is gradually to drift back to its original purpose of simply exercising police power. For instance, the other day one of the most distinguished members of the bar told me how he was to plead a case before the Supreme Court of the United States, and because the ethics of the bar were disregarded by the representative of the government, he was simply outlawed with regard to the time for the presentation of the case, after solemn agreement, and the only recourse he had was, "Well, you must understand you are now dealing with the government." The government, after all, being a mob, is not necessarily subject to the ordinary ethics of human society.

If the government, therefore, proceeds to absorb all these various activities of human society, what will be the result? Instead of maintaining a condition that will be most wholesome for the individual, it tends to the enslavement of the individual, to the degradation of the individual citizen.

It was to get away from a condition like that that the people came to develop this great republic, seeing to it that only a minimum of power should be given to the government, and that the maximum amount of power and resources should be reserved for the individual. All this has led up to the particular point that I want to emphasize tonight, and that is this: There is a movement on foot to establish what is known as state medicine. In other words, there will be, according to the program of those who advocate state medicine, such an ideal condition, such a Utopia, that everybody under heaven is going to receive a maximum of attention from the medical profession for a minimum of expenditures. Of course, in that great Utopian undertaking the most essential element for the success of such a scheme is utterly disregarded, and that is the individual physician, the individual surgeon, who, after all, must be given a field in which he shall not be dominated by powers that are developed by the mob and determined by the mob. Because, while the great mass of humanity may undertake to initiate certain legislation that seems to be beneficial, there are always those in the political field who manipulate all legislation to their own personal advantage. Instead of being statesmen in order to sacrifice themselves for society, they are mere politicians who believe that society exists for their profit, just the same as the quack of the medical profession. Instead of considering that the medical profession is a science in order to advance the welfare of human society, it is nothing more than an opportunity for him to gain a very lucrative living.

On account of those conditions, I feel that the members of the medical associations should unite in an appreciation of what they owe, not only to their own society but what they owe to human society at large; that they will still maintain that position accorded to them by the father of medicine who emphasized the fact that the physician was called, in the plan of society, to serve, and to serve in a field where there could be no material compensation adequate to repay him for his services. In other words, the services of any true professional man cannot be measured in terms of money. The object of the true professional man is to strengthen society, instead of looking out for himself, and his own interests, at the expense of society.

This is especially true because of the sacred relationship that the physician and surgeon must always retain to the individual family. No human being can appreciate the great joy that comes to him who enjoys fatherhood or motherhood, unless one is conscious of having participated in bringing a life into the world. Only secondary to that great achievement and to the joy that it brings is the achievement of those in the medical profession who can preserve the life that comes, and can give of themselves their genius, their skill, their learning, their energy, their very lives, in order to maintain that which is the most precious thing that man has under heaven, the life that gives him the opportunity to work out his destiny, for a life that is still greater and still more wholesome and still more satisfying.

I want to say to those assembled here tonight, I hope everyone, layman as well as members of the medical profession, will see to it that there will be no experiment in government that will tend to subjugate the medical profession, dictate to the medical profession or say to them that they shall become mere hirelings to work for a wage, rather than to be men in their respective professions to receive an honorarium which is only an expression of gratitude by those who receive their service, because they know they cannot repay that service.

MODERN CONCEPTION OF CHRONIC ARTHRITIS*

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THE vast amount of work done recently on the subject of chronic arthritis is in marked contrast to the interest shown prior to ten years ago. Before the International Committee for the Control of Rheumatism was organized there was a lack of interest which is remarkable when one considers the tremendous number of cases and the long duration of suffering, not to mention the great economic loss caused by the chronic arthritides. It was only after a number of European countries instituted state medicine and state health insurance that we became aware of the great percentage of the total illness which was caused by the chronic joint diseases. It has been estimated that from 10 to 20 per cent of all sickness claims made in England are due to chronic rheumatism.[12] When government authorities learned that so large an amount of money was being spent to take care of their patients with chronic arthritis they felt that something should be done to remedy this condition. The result was the formation of the International Committee for the Control of Rheumatism. This committee, of which our American Committee is a part, has been instrumental to a considerable extent in stimulating the recent interest in chronic rheumatism.

In order to follow this recent work intelligently it is necessary first to understand clearly the nomenclature used. The classification of the chronic joint diseases is still so confused that it is imperative that the specific type of arthritis under discussion be clearly defined. A review of the past history of the attempts of classification of the arthritides is tempting and would be of considerable interest but does not seem to fall within the scope of this paper. It need only be stated that numerous titles and subtitles were used in different countries. A student of this disease in one part of the world was never sure exactly what type of arthritis was under discussion either in this country or in any other country. It would appear that every worker in this field would eventually devise a classification of his own. When Virchow brought out the term, arthritis deformans, it added nothing but confusion to an already confused field. Now it has been agreed by almost everyone that the term, arthritis deformans, be dropped entirely. It adds nothing to the clarity of the subject.

It remained then for the English to discover finally that all types of chronic joint disease tend to fall into two main groups. These were labeled by Garrod,[11] rheumatoid and osteoarthritis. This grouping tended to clear up the subject to a great extent and has resulted in considerable advance in the study of arthritis. It is my purpose then to discuss the types of chronic joint disease

*Read before the Post-Graduate Medical Course, Iowa State Medical Association, Waterloo, Iowa, April 20, 1933.

which come under the general heading of rheumatoid and osteoarthritis. It is purposed to exclude tuberculous arthritis for the reason that this is a specific disease and the pathology is quite characteristic. Rheumatic fever is also excluded but the relationship between rheumatic fever and chronic arthritis will be discussed later. Neither am I going to discuss the type of chronic rheumatism known as fibrositis, which includes a variety of diseases such as lumbago, myositis, muscular rheumatism and so forth.

PATHOLOGIC DIFFERENCES

When the American Committee for the Control of Rheumatism began their investigations it was necessary to decide upon a particular classification. Members of this committee were well aware of the difficulty with the nomenclature and after study decided on the use of the classification which was proposed by Nichols and Richardson,[15] namely, proliferative and degenerative arthritis. These are synonymous with the English rheumatoid and osteoarthritis, respectively. More than twenty years ago Nichols and Richardson reported their study of some sixty-five cases of chronic arthritis. This treatise is probably the most thorough pathologic research ever done on this subject and their conclusions have recently been confirmed by Allison and Ghormley.[1] After spending eight years on this pathologic study, Nichols and Richardson felt that they could again divide all of their cases into two main groups and it becomes necessary to discuss their findings somewhat in detail. The authors stressed the point that the cases of the two main groups were not necessarily of different etiology; in fact, there was considerable overlapping from the etiological point of view. Nichols and Richardson emphasized that a certain pathological alteration of a joint may be the result of a variety of irritants or agents and a given irritant or agent may produce a variety of pathologic changes. Trauma, acute suppurative infection, gonorrhea, syphilis, and other probable factors may induce primary proliferation of the synovial membrane; while old age, trauma, bone tumor, gout, diseases of the central nervous system and other causes may lead to primary degeneration of the cartilage. Nichols and Richardson thus included under proliferative arthritis various types of specific and nonspecific arthritides. It is important to bear in mind this definite contribution of Nichols and Richardson; namely, that a variety of causes may produce the same gross and histologic changes and one etiologic factor result in a variety of pathologic pictures. Many writers have adopted a different usage, applying the term "proliferative arthritis" to designate nonspecific disease only and describing all specific infections separately. Pathologically, Nichols and Richardson did not differentiate a gonorrheal or staphylococcic joint from nonspecific arthritis; all were proliferative arthritides. Nor were they able to differentiate between degenerative arthritis secondary to trauma, syphilis or senile changes. This same excellent treatise also brought out the fact that a proliferative arthritis, if it continued sufficiently long, might develop changes characteristic of the degenerative type, particularly osseous hypertrophy. In one and the same patient, at the same time, one may find one joint with typical degenerative changes and another showing definite proliferative changes.

The proliferative process, which was found to be of sufficient importance to form the basis for a classification, commonly begins in the synovial membrane and it is necessary to remember that the term "proliferative" always does, or at least always should, refer to synovial proliferation. A pannus-like membrane of granulation tissue is the result of the proliferative process; this membrane spreads over the joint cartilage. Wherever the pannus comes in contact with the cartilage it produces erosion and destruction. At the same time a reaction is stimulated in the perichondrium, which starts to proliferate, developing new cartilage and even new bone. Thus several processes are in progress: synovial proliferation, destruction of the cartilage, and formation of new cartilage and new bone. There may be also a proliferative process in the subcartilaginous endosteum invading the joint cartilage, which thus is being destroyed from both above and below. The epiphyseal bone marrow shows an increase in connective tissue and increased vascularity. There may or may not be an epiphyseal diminution of the bone trabeculæ. The decrease in epiphyseal bone tissue on the roentgen film gives an atrophic appearance and explains the x-ray name for this type of arthritis: atrophic arthritis. Fibrous adhesions occur early and often become extensive, producing a multiloculated joint, leading to further bone atrophy. In advanced cases the joint may be entirely destroyed and the adjacent bones fused together

TABLE I. CLINICAL DIFFERENCES BETWEEN PROLIFERATIVE AND DEGENERATIVE ARTHRITIS

	Proliferative	Degenerative
Onset	Acute or subacute	Insidious, chronic
Age group	Younger: 20-40	Older: 40-60
Type of joint	Increased fluid with fusiform swelling	Usually dry with general diffuse enlargement. Crepitus often occurs.
Sex	Three times as common in females	Slightly more common in males
Joints affected	Smaller joints of hands and feet first. Often symmetrical involvement of joints: wrists, knees, ankles. Spine and jaw joint often involved.	More common monarticular: hip joint, shoulder. Not symmetrical.
Muscular wasting	Marked	Not prominent
Pain	Usually marked	Usually not marked, although very variable
Limitation of motion and deformity	Early and marked. Ankylosis early: fibrous or osseous.	Usually comes on after years. Not real ankylosis; limitation often due to exostosis.
Vasomotor phenomena	Often precedes actual development of arthritis. Raynaud's disease: cold hands, increased sweating.	Arteriosclerosis common
Constitutional symptoms	May be marked	Usually not marked

with a continuous marrow cavity. Subluxations and dislocations are frequent in proliferative arthritis. Effusion into the joint cavity together with articular and periarticular swelling produces the characteristic fusiform joint of this type of arthritis.

Degenerative arthritis, on the other hand, is characterized by fibrillation and degeneration of the joint cartilage, especially in its central portion, together with an overgrowth of bone at the edges of the joint. As the name indicates, this is primarily a senile degenerative process with little evidence of inflammation. Ankylosis or adhesions do not occur although there may be locking of the joint due to exostosis.

CLINICAL DIFFERENCES

Clinically these types may be differentiated in the manner shown in Table I.

ROENTGEN DIFFERENCES

The roentgen examination of the joints gives a fairly good picture of the inherent pathology of chronic arthritis. In most instances a fairly clear cut differential diagnosis between proliferative and degenerative arthritis can be made with the use of the x-ray. As has been stated there is more or less overlapping between these two main groups and occasionally a patient will be seen with joints of both types. Especially is this true of those people with proliferative arthritis who have had the disease for many years. Some of these long infected joints may eventually develop degenerative changes. It is also well to call attention to the fact that early in the disease even in the presence of considerable pain, the x-ray studies of the joint may be entirely negative. Proliferative arthritis is diagnosed by atrophy of the bone and soft tissue, destruction of the bone and cartilage and fibrotic or even bony ankylosis. Any or all of these findings may occur in the proliferative type.

Degenerative arthritis, on the other hand, is characterized in the x-ray film by an overgrowth of new bone, especially at the margins of the joints and occasionally by eburnation of bone with no evidence of bone atrophy and no destruction of bone or cartilage and no ankylosis. The x-ray changes may occur a few months after the inception of the disease or only after many years of activity.

PREDISPOSING CAUSES

There are many predisposing causes in chronic arthritis; this is especially true in the proliferative type. The underweight, visceroptotic young

women who commonly develop arthritis, appear to have an hereditary constitutional weakness. They are prone to have many foci of infection, they suffer from chronic fatigue, and they have poor circulatory control. Long continued fatigue, severe emotional strain are conducive to the development of proliferative arthritis. In some instances an injury to one joint may be the beginning of a severe generalized arthritis. Degenerative arthritis occurs more commonly in the overweight, apparently healthy individual, who has a tendency toward arteriosclerosis. Often this type appears at the time of menopause. Chronic arthritis is much more common in the temperate climates and is practically unknown either in the tropics or among the Eskimos.

There is evidence that some forms are due to endocrine disturbance but our knowledge of the endocrines is still too fragmentary to enable any authoritative opinion. A low metabolic rate, especially in women, with arthritis is not uncommon and for that reason small doses of thyroid have been given with more or less evidence of improvement. For many years a number of students of this disease have stressed the importance of dietary and bowel disturbances as a prominent cause of the chronic joint diseases. Pemberton[16] especially has felt that overindulgence in concentrated carbohydrates is an important factor in the cause of arthritis. Many patients have chronic constipation and a number of detailed x-ray studies tend to show frequent malformations of the large bowel. This has led to the persistent use of high colonic flushing with variable results.

DIFFERENCES BETWEEN RHEUMATIC FEVER AND RHEUMATOID ARTHRITIS

Because some investigators have found streptococci in the blood of patients with rheumatic fever as well as in others with proliferative and degenerative arthritis, they have concluded that all these rheumatic conditions are all one and the same infection, the clinical differences being explained on an age difference. That is, when a child develops rheumatism rheumatic fever is the result; while a young adult develops rheumatoid arthritis and an older person, the degenerative type. These workers also point out the similarity between rheumatic fever and rheumatoid arthritis in that subcutaneous nodules are found in both of them. While it is true that these two types of rheumatism do have these similarities there are so many distinctive differences that it seems advisable to keep our clinical classification and not throw all these clinical identities into one jumble. Most investigators are agreed that degenerative arthritis can be taken out of the infectious classification as it presents none of the clinical or pathological characteristics of an infectious disease. In comparing rheumatic fever with rheumatoid arthritis it is well to note that rheumatic fever is distinctly a disease of early childhood, the peak of incidence occurring in Minnesota at the age of six, while rheumatoid arthritis occurs more commonly in early adulthood. Cardiac involvement of a permanent nature occurs in sixty per cent of patients with rheumatic fever and occurs rarely in rheumatoid arthritis. Rheumatic fever is usually a much more acute disease but never leaves any permanent changes in the joints. Occasionally rheumatoid arthritis has a rather acute onset and in the early stage of the disease it is sometimes difficult to differentiate between an attack of rheumatic fever and the acute onset of rheumatoid arthritis. Careful clinical observation should in most instances overcome any difficulties in differential diagnosis. An attack of acute migrating polyarthritis appearing in a patient over twenty years of age, especially when this is the first attack, should immediately arouse suspicion that the case may be one of rheumatoid arthritis. Furthermore, the patient with an acute onset of rheumatoid arthritis frequently has involvement of the mandibular, cervical spine and the sterno-costal joints and these joints are not commonly involved in rheumatic fever. And more important still, these acute proliferative cases are usually left with one or more joints permanently involved while in rheumatic fever the joints, even though they may be more acute for a continued period of time, never develop permanent changes. Occasionally in a rare instance the involved joints following rheumatic fever fail to clear up for a period of months but in every case that has come under my observation the recovery has been complete and no permanent joint changes resulted. I have had the opportunity of studying several hundred cases of rheumatic fever over the past twelve years and amongst these cases I have observed three children who had protracted joint swelling which lasted in one case over a year; in all three of

these children the joints have completely cleared. In following these children from childhood into early adulthood I have not seen a single instance where a patient has developed chronic arthritis directly following rheumatic fever. If these two diseases were the same, one would expect to see at least an occasional case show such a gradual development from rheumatic fever to chronic arthritis. Furthermore, it has been shown that in some countries, as in Holland, chronic arthritis occurs quite commonly while rheumatic fever is relatively rare. One would expect a more equal distribution in these two diseases, were they the same. Certainly from a clinical point of view rheumatic fever is a distinct entity and should not be considered the same disease as rheumatoid arthritis.

The bacteriological study of chronic arthritis is progressing with intense interest in many parts of the world at the present time. A number of reports appearing recently have been very enthusiastic. Some investigators have reported a specific organism which they are sure causes atrophic arthritis; others have said that there is no specific organism but that many types of bacteria, especially the streptococcus, may cause the disease. The finding of staphylococcus has also been reported by others as the cause of most of their cases. A decided difference of opinion exists as to which types of arthritis are infectious and which are not. A few students of rheumatism are of the opinion that all types of arthritis from rheumatic fever to osteoarthritis are caused by the streptococcus. Many workers disagree with this opinion and a good deal of work has been done to show the differences between the two main types of chronic arthritis. Clawson[20] was able to find about 50 per cent positive blood cultures in all types of arthritis while practically all others find a higher or lower number of positive cultures in proliferative arthritis but a very small percentage or no positives in the degenerative cases.

The agglutination titre of the serum and the sedimentation rate[10, 19] of the red blood cells has also been used in the differential diagnosis and it has been found that the agglutination titre is much higher in the proliferative type and the sedimentation rate is much more rapid than in degenerative arthritis. There is decided disagreement on every phase of this subject.

THE BASIS FOR THE USE OF STREPTOCOCCUS VACCINE

The use of streptococcus vaccine in the treatment of chronic arthritis and other types of rheumatism is not new. Small doses of vaccine subcutaneously over prolonged periods of time have been used for twenty years or more. Recently as a result of a large amount of experimental work the intravenous method has been preferred to the subcutaneous route of administration of the vaccine.[5, 17] It has been shown that animals could be made hypersensitive or allergic by subcutaneous administration of vaccine and that this method of treatment probably did more harm than good. It was further shown that animals could be desensitized by giving the vaccine intravenously and this method has become popular in many clinics. Not all workers are agreed on this phase of the subject and some investigators are still using the subcutaneous method, using very minute doses of vaccine.

The use of streptococcus vaccine is based on the following three premises:

1. That chronic arthritis is caused by either a specific type of streptococcus or at least by various strains of streptococci.

2. That the agglutination reaction is a specific one and that the increase in agglutination titre indicates an increased immunity to the disease.

3. That a subjective symptom, like the relief of pain, can be accepted as a therapeutic index in such a disease as chronic arthritis.

It is well to consider these premises somewhat in detail. This is, as you notice, a most involved and controversial subject and I hope my brief discussion will not further confuse you. A study of the most recent literature shows anything but agreement as to whether or not the streptococcus is the actual cause of chronic arthritis. Such excellent investigators as Cecil[4] and his co-workers, and Clawson have been able to obtain from 50 to 80 per cent positive blood cultures in their cases. Recently various others have been able to repeat this work. On the other hand, equally good workers including Dawson,[8] Hench,[3] Coburn[6] and Cooley[7] (working with cases of acute rheumatic fever where one would expect to find the highest incidence of positive cultures) have been able to find no organisms even after painstaking and exhaustive work. In my own experi-

ence, I have been unable to find any organisms in blood cultures from thirty cases of subacute rheumatic fever in children and in collaboration with Dr. Luther C. Fisher, Jr., in twenty cases of chronic arthritis in adults. If one were to place the positive reports in the most recent literature against the negative reports it seems quite possible that the reports would balance. As to whether the streptococcus appears in the blood in chronic arthritis one is at liberty to take his choice from the various articles in the literature. This work has been done in the best of institutions by our most expert bacteriologists. Granted for the moment that the streptococcus does appear in the blood, is this a primary infection or does the streptococcus appear only as a secondary invader? There is a good deal of evidence substantiating the latter point of view. For instance, it is known that proliferative arthritis not uncommonly occurs as a result of various debilitating diseases such as typhoid fever, bacillary dysentery and many other prolonged infectious conditions. It is reasonable to suppose that such cases are probably due to secondary infection. Lichtman and Gross[14] recently reported the result of their study of over five thousand blood cultures carried on over a period of five years. This excellent report gives considerable weight to the idea that the streptococcus might easily be a secondary invader. They were able to show that the percentage of positive blood cultures in their cases of various types of rheumatism was approximately the same as the percentage of positive cultures in such conditions as aplastic anemia, pernicious anemia, leukemia, colitis, meningococcus meningitis, pyelitis and pyelonephritis. They conclude that the finding of the streptococcus in the blood in rheumatism in general and in any of the mentioned diseases can be explained as a transient invasion of the blood with the streptococcus and "these organisms can not justifiably be considered as the causative agent of these diseases." One can conclude, therefore, that the streptococcus nor any other organism has been proven to be the specific cause of chronic arthritis and that its presence in the blood stream may be explained as a secondary invasion or a transient manifestation.

THE AGGLUTINATION REACTION OF THE BLOOD IN ARTHRITIS

The agglutination reaction has been used to identify specific strains of streptococci and as an index of therapeutic improvement; that is, it has been claimed that patients that showed an increase in agglutination titre as a result of intravenous vaccination showed clinical improvement. The agglutination reaction is technically difficult to study and conclusions drawn from its use have been in many instances too hasty. One need only read the monograph of Andrews and Christie[2] on their attempts to classify the streptococci to understand the extreme difficulty which this problem presents. After seven years of work these investigators concluded "the more one studies the hemolytic streptococci, the more strongly is the impression gained that they are in a state of constant flux in which it is difficult to find any firm foundation for a permanent classification."

These workers showed that there were almost insurmountable difficulties with the agglutination test; they also point out that different investigators are using different methods of agglutination and it is impossible to draw conclusions from such reports. Tillett and Abernathy[18] recently showed that with their method they obtained equally high titres from blood obtained in various diseases such as pneumonia, undulant fever, and tuberculosis as from blood of patients with chronic arthritis. Keefer[13] and his co-workers, on the other hand, recently showed that with their method the titre was much higher in arthritis than in any other disease. From all these contradictory reports I believe it is fair to conclude with Dawson and his co-workers that "the significance of the agglutination reaction in rheumatoid arthritis serum is largely a matter of conjecture."[9]

It is a well known fact that chronic arthritis of the proliferative type is characterized by exacerbations and many cases clear up spontaneously. To accept a symptom like the relief of pain as an indication of therapeutic effectiveness of a specific nature seems hardly reasonable. Many drugs, as well as various nonspecific foreign proteids, are equally effective in this regard. Furthermore, it is well to point out that many cases of chronic arthritis are treated with vaccine over long periods of time and it is fair to assume that at least a good percentage of such patients would probably have received equally good results without the vaccine treatment. The most enthusiastic reporters have as yet given us no follow-up reports after a period of three or four years from

the first introduction of their vaccine, and until such reports appear no opinion can be given as to the efficacy of streptococcus vaccine in the treatment of proliferative arthritis. I have had occasion to use such vaccine in about fifty cases of chronic arthritis. I can not say that the results have been striking. In an occasional case it appeared that considerable progress was being made but for the most part the results were negative. Psycho-therapy in a chronic, long-continued disease like chronic arthritis is very effective in the hands of a physician with the proper personality and some of the favorable results from vaccine treatment may be on this basis. As to the reports that 80 per cent of patients obtain improvement from vaccine, one need only review the older literature and he will find equally favorable results reported from the use of injections of sulphur and a host of other therapeutic measures. It seems fair to conclude that streptococcus vaccine in the treatment of proliferative arthritis has not been proven of specific nature, that results from its use are not startling, and that it has not been used for a long enough period of time in a well-controlled series of cases to determine its value. Anna Williams[21] in her recent monograph on "Streptococci in Health and Disease" has concluded her chapter on the streptococci in rheumatism as follows:

"The question as to how far the use of vaccine or serums or both can be expected to do any good in any of these conditions is still to a large extent unanswered.

"In regard to vaccine in cases of chronic infectious arthritis where they might be supposed to do most good, we seem only to have touched on the effect of allergy in regulating the dosage, and in choosing the best strains of cocci to use in preparing the vaccines. In those cases proved to have streptococci in the blood the various antiserums so far tried have given usually negative or unsatisfactory results."

Most investigators are agreed that degenerative arthritis is probably not of infective origin. Clinically and pathologically this type of arthritis does not present the characteristics of a disease due to infection. Here again the problem of endocrine disturbances is presented. No definite information has as yet been developed along this line. As was stated previously, women commonly develop osteoarthritis in a knee or hip joint at the menopause. The relationship between ovarian degeneration and osteoarthritis is not known. Chronic irritation due to accident does, however, appear to be a prominent factor in the development of degenerative arthritis. Not uncommonly this type of arthritis develops after a fracture into a joint. Men in industry who use one particular joint unusually hard, as in pushing a lever with one foot develop osteoarthritis in that joint. Patients who develop osteoarthritis in the knees and hips are usually overweight and it is believed that constant pressure on these joints due to the increased weight is a factor in the development of the joint disease. Fisher in his recent excellent book on arthritis has shown that animals develop osteoarthritis after introduction of a foreign body, such as a metal shot, into the joint. It is also known that men who do unusually hard work, such as heavy lifting, develop osteoarthritis of the spine. Injury to the joint, whether acute or chronic, is probably a prominent causal factor in degenerative arthritis.

TREATMENT

The joint symptoms in proliferative arthritis must be considered as an external manifestation of a generalized disease. With this idea in mind it becomes necessary then in the beginning to treat the entire patient and not limit our therapeutic endeavors merely to what we can see in the joints. Anemia, undernourishment, visceroptosis, faulty eating habits, habitual constipation, faulty posture, vasomotor instability, all these things are common in atrophic arthritis and need active treatment. You will note that I place these factors ahead of foci of infection; not that I think it is not important to treat all foci of infection, but that I do believe it is more important in the early treatment of these patients to improve by every possible method their general health. For every case that is benefited by the removal of foci of infection many more are not changed in the least and others are made definitely worse by the drastic removal of teeth, tonsils, gallbladders and what-not. The removal of such foci of infection is especially dangerous in these patients before their resistance is improved. It is necessary early in the disease to obtain as far as possible physical and mental rest; and this means, in the most severe cases, bed rest. Having put a patient with proliferative arthritis to bed does not mean completely forgetting about the state of the joints and muscles. Various physio-

therapeutic measures, including massage, radiant heat, diathermy, hydrotherapy, ultra-violet radiation can be profitably utilized during this period. It is my impression that for the most part this form of therapy has been neglected in this country. When one visits the numerous spas and health resorts in England and the Continent and notes the elaborate institutions for utilizing the many physio-therapeutic measures which have been perfected, it is realized that we in this country have fallen behind in this respect. It is probably for this reason that so many of our rheumatic patients at one time or another fall into the hands of quacks who in many instances are far It may be true that chronic arthritis is not cured completely in these elaborate European institutions, but as one of the workers in such an institution remarked to me, "We do keep them comfortable and at work." In some instances it is necessary to order a change of environment for the nervous type of arthritic, but for the most part chronic arthritis can be effectively treated by the general practitoner.

In attempting to improve the general health of these patients the diet is important. Pemberton, as was stated previously, believes that they should be placed on a low caloric, low carbohydrate, high vitamin diet but it is my impression that most clinicians are using a rather high caloric, high vitamin, easily digested diet; especially in those patients who are underweight. It is rather important to obtain proper bowel action by whatever means seems advisable in the individual case. The use of cod liver oil and viosterol, iron for anemia and small doses of insulin to increase the appetite are of value where indicated.

Throughout the treatment the patient should be kept free from pain by the use of the numerous drugs which are used for this purpose. It is not necessary to enumerate the long list of drugs used to kill pain in arthritis; some use one, some another, with varying results, depending upon the patient and the doctor. It is well, however, to use these drugs in adequate dosage to obtain the desired effect—a dose sometimes much higher than the official one. Foreign proteins have proven very effective in the hands of many clinicians. Milk, peptone, various bacterial proteins, and especially typhoid vaccine, prove of value in many instances. Typhoid vaccine is most commonly given at present intravenously and in sufficent dosage to produce a marked chill and fever. This type of treatment can be used over a period of time but only in those patients who are fairly robust and who respond well. A greatly weakened and debilitated patient should not be given this treatment. It is well to remember that a few deaths have been reported following the use of typhoid vaccine. Most clinicians have obtained very favorable results following the careful use of typhoid vaccine given intravenously.

Streptococcus vaccine is being used extensively in the treatment of rheumatoid arthritis at the present time. Its use is indicated only as an adjuvant and not as the sole treatment. It should be administered intravenously and in small doses and in my opinion is not indicated in older people. It is considerably more important to treat the general condition of the patient than to hope for a cure-all in vaccine treatment of any kind. It is also my impression that autogenous streptococcus vaccine is impractical for the most part and equally good results can be expected from stock vaccine.

Returning again to the question of the removal of foci of infection, it is well to note that the radical removal of these foci is indicated in the earliest stages of the disease when the general health of the patient is not too impaired. Little can be hoped for in the removal of various organs of the body in patients who have had the disease for years. These people have adjusted themselves to their infected foci and in many instances, as was stated before, their condition is made worse by the drastic operative procedures which have been so prevalent in the past.

Fibrous or bony ankylosis is common in proliferative arthritis and for this reason it is most important that deformities be prevented. With the patient in bed in the acute stage of the disease the joints should be kept in the optimum position in case ankylosis does develop. It is deplorable to see these patients appear in a University Hospital with their joints "frozen" and in a helpless condition due mostly to neglect. Even in an extensive case with marked involvement of many joints, the difference between a morbid, depressed, hopeless individual and one who still has an interest in life may be only enough motion in the knees and arms to permit walking with the aid of a cane or crutch and to enable him to feed himself and make his own toilet.

In the far advanced cases with marked defor-

mity, orthopedic consultation is necessary and every effort should be made to so liberate some of the joints that the patient is not completely helpless. Orthopedic surgeons who are skilled in the reconstruction of joints often obtain remarkable results in apparently hopeless cases.

What has been said under the treatment of atrophic arthritis in the treatment of the entire patient is equally true in the treatment of hypertrophic arthritis. It is necessary to treat whatever symptoms present themselves. Anemia, constipation, obesity (which is common in degenerative arthritis) need to be treated. Mental rest and removal of all sources of irritation as far as possible should be obtained. All sources of chronic injury to the joint need to be removed. This may in some instances necessitate a change of occupation where the particular joint is involved due to overwork. Obesity also acts as a chronic source of injury, especially to the weight-bearing joints, and in these cases the overweight needs to be actively treated by diet and the use of desiccated thyroid where indicated. As stated under the treatment of proliferative arthritis, the patient should be kept free from pain by the aid of analgesic drugs. In many cases all that is necessary is to put these hypertrophic joints to rest for a week or two and the symptoms disappear. In this type of arthritis ankylosis and deformities need not be considered as they do not occur. Surgery is contraindicated in these older patients, excepting for the possible removal of a loose joint body which may be causing trouble. Vaccines and large doses of foreign proteid should be used with the greatest caution in osteoarthritis and preferably not at all. With the use of rest and various form of physiotherapy to increase the circulation to the joints and to allay pain, these older people with a painful shoulder, hip or knee can be kept quite comfortable. They should be reassured that the prognosis is good and that no chronic deformity will develop. Such reassurance itself will many times overcome most of the suffering. The drastic removal of foci of infection in osteoarthritis is not indicated as this is probably not an infectious disease.

DISCUSSION

I have tried, as briefly as I could, to indicate that all types of non-tuberculous arthritis tend to fall into two main groups which have been labeled proliferative and degenerative. In the present state of knowledge it is unwise to be dogmatic about any phase of this subject. It is not definitely known whether or not the streptococcus is the cause of any or all types of nonspecific arthritis. We do know, however, that the proliferative type presents the picture of an infectious disease, both clinically and pathologically, but that the degenerative form of arthritis appears from the same points of view to be noninfectious. These two main types present quite definite differences in their onset, predisposing causes, x-ray changes and prognosis. Because of these inherent differences, it is necessary to treat them differently, always remembering that there is more or less overlapping between the two groups. I have also tried to stress the importance of treating the whole patient primarily as well as treating the joints locally. Certain advances have been made in the study of arthritis and more are sure to come, but while we await these new discoveries it is important that we give our arthritic patient the advantage of all the knowledge we already have. The majority of arthritic patients can be kept comfortable, deformities can be prevented, and the development of permanent invalids avoided. We need to change our entire outlook on this subject and take a more optimistic point of view.

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GENERAL MANAGEMENT OF TUBERCULOSIS*

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THE general management of tuberculosis includes a thorough study of the entire body as well as treatment of the tuberculosis itself. The study of the entire body is necessary because the body in which the tuberculosis exists is subject to the same ills as any human body. Correcting these non-tuberculous ills will reduce the load the consumptive has to carry and consequently increase his chances for recovery.

With these general remarks about the advisability of a complete medical study of tuberculous patients, let us proceed with the discussion of the treatment of tuberculosis itself which centers about rest of the diseased part. This may be obtained in the form of general rest or bed rest or in the form of localized rest or collapse therapy or it may be, and usually is, a combination of the two.

The treatment of tuberculosis as it is carried out today is the outgrowth of methods suggested by Herman Brehmer,[2] who believed that tuberculosis was due to a muscular defect in that the heart was too small or too weak to supply the lungs with proper nourishment. His treatment, which was directed towards correcting the supposed cause, consisted of measures to strengthen the heart and improve the nutrition and strength of the body. He believed that fatigue interfered with the recovery and so each patient was put to bed during periods of toxemia. After the toxemia had disappeared he believed enough rest could be secured through the proper combination of rest and exercise. To accomplish this he built his sanatorium in the valley so that the last part of the patient's walk would be down hill as this is less fatiguing than walking up hill. He surrounded the sanatorium with a beautiful park and placed benches every twenty steps so that his patients could rest frequently and thus avoid fatigue.

Dettweiler, Brehmer's assistant, believed that the consumptive needed more rest than he could obtain in this manner and when he opened his Sanatorium in Falkenstein, Germany, in 1874, he added resting in a cure-chair in the fresh air to Brehmer's therapy.

Trudeau,[5] in a paper presented before the American College of Physicians in 1900, called attention to the amount of rest the surgeon used in the treatment of tuberculosis of the joint and

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to Murphy's proposed artificial pneumothorax as evidence of the value of rest. However, from closing remarks it is apparent that Trudeau believed bed rest was necessary during periods of toxemia only and that after the toxemia had disappeared the degree of rest should be guided by the symptoms. This was in accord with the best treatment of that day and apparently was aimed at the control of two symptoms, namely, loss of weight and strength, and the belief that when these were corrected the individual was well. This might be called the symptomatic or the ambulant treatment, and is still employed by some physicians.

Pratt,[5] in a paper before the National Tuberculosis Association in 1907, was, I believe, the first to suggest the use of prolonged bed rest in the absence of toxemia and in 1918[6] he wrote, "It takes a long time for scar tissue to form. Hence, according to the severity and extent of the disease months and years must elapse after the development of a fresh tuberculous process before pulmonary exercise can be undertaken without danger." The soundness of his ideas was well demonstrated when we began to take serial x-rays which gave visible proof: (1) that the symptoms of toxemia could subside and the individual could regain all of his lost weight without much if any change occurring in the tuberculous process; (2) that healing, whether it be by resolution or fibrosis, is enhanced by rest and retarded by exercise; (3) that relapses were much more likely to occur while the healing was going on than after the lesion had become stabilized.

These facts indicate that if those conditions which favored healing of the diseased area were continued until that healing had ceased or until the lesion had become stabilized, then relapses would be less frequent. They also indicate that the chances for recovery are greater if the treatment is directed towards the control of the pathological process than if it is directed towards the control of the symptoms. With this shift in the emphasis of the treatment has come about a different conception of what is meant by rest, of when it is indicated, how intensive it should be and how long it should be used, so that whatever advances have been made in the treatment of tuberculosis itself in the last thirty years have been made through the use of rest therapy.

What is meant by rest and when is it indicated? This varies with the individual physician. Nearly every one agrees that rest means bed rest during periods of toxemia. However, some believe that when the toxemia disappears bed rest is no longer necessary and all that rest means then is merely keeping the physical activities below the fatigue level. Under such a plan, of course, the individual is not to work but he can loaf around the house doing about as he pleases as long as he does not become tired. Such physicians are still following the plan of treatment outlined by Brehmer in the middle of the last century. Others believe that as healing occurs more rapidly under conditions of rest than it does under even modified exercise, bed rest is indicated at the beginning of the treatment for every patient, minimal or advanced, toxic or non-toxic. This is a general rule and of course must be subject to modification. For instance, repeaters and old chronic cases of fibroid tuberculosis where there is little or no chance of recovery, where the problem is a public health one rather than a medical one, can be given more liberties.

How intensive should bed rest be? This will vary with each patient and so any plan of bed rest should be elastic enough to permit of individualization and modification.

It is impossible to state definitely just how long a patient will be held in each group (Table I). Depending upon the age of the patient, the extent and character of the lesion, the symptoms and changes in the lesion as determined by x-ray films repeated every four months, the patient is either held in the same group or is advanced to the next.

According to the above mentioned table, bed rest is divided into three groups, intensive bed rest, strict bed rest and regular bed rest. Each patient receives intensive bed rest at the beginning of treatment and as his condition improves he is allowed a little more freedom until he is receiving regular bed rest.[8] This is the type of bed rest used for the non-toxic patient who is waiting for his lesion to become stationary. These patients feel well, sit up in bed, read, write, do occupational therapy or vocational training but are always cautioned to remember that mental activity is exercise and therefore that it should be kept below the fatigue level.

How long should bed rest be continued? That is one of the most disputed points in tuberculosis

TABLE I—CLASSIFICATION OF BED REST
Glen Lake Sanatorium

ACTIVITIES	INTENSIVE (1)	STRICT (2)	REGULAR (3)
Sit up in bed for meals and other purposes	No	No	Yes
Meals	May or may not feed himself lying on side after food has been cut	Feed himself lying on side	Feed himself sitting up
To x-ray, lamp or treatment room	Only in the bed	Only in the bed or on a litter	In wheel chair
Occupational therapy, reading, writing, etc.	No O.T. work. No writing. Certain patients may read if bookrest is used	Yes, while on side or lying down	Yes, sitting up in bed
Type of disease	Toxic-febrile Caseous non-febrile Certain patients with far advanced cavity formation who are non-operable	Non-toxic fibro-caseous lesion More extensive fibroid lesion Patients from group (1) who have improved sufficiently to stand more freedom in bed	Non-toxic fibroid lesion. Patients from groups (1) and (2) with long-standing lesions of any degree who have shown sufficient improvement

therapy. Some physicians believe that it should be discontinued as soon as symptoms of toxemia have disappeared. Others believe that it should be used for a definite period of time, say six weeks or even six months. Others, including ourselves, believe that each patient presents an individual problem and that the results to be expected from bed rest should determine how long bed rest is to be used rather than any definite fixed period of time. Therefore if one wishes merely a subsidence of symptoms and a quiescence of disease, bed rest need not be as prolonged as when one wishes as complete an investment of the tuberculous process as bed rest can produce. In any event as long as the patient is improving as determined by serial x-rays we see no reason for changing the treatment until the desired results have been secured or until it is apparent that bed rest will not produce the desired results except after years of treatment.

This standard of continuing bed rest as long as the patient is improving under bed rest is the result of the gradual evolution of our ideas concerning the value of bed rest and was first suggested to us by the writings of Pratt. At first we kept patients in bed only a few days after symptoms had subsided, then this was increased to two weeks, then to six weeks and then to a period twice as long as they had had fever. The next step was to twice as long as they had had either fever or increased pulse rate after carefully excluding any other factor which might have caused the rapid pulse. The last step was our present plan. We believe that the standard which the surgeon applies in the treatment of bone and joint tuberculosis, namely, fixation until ankylosis or healing ceases, applies just as aptly to tuberculosis of the lung. Furthermore, there is general agreement that pneumothorax which produces a much more complete rest of the diseased lung than does bed rest should be carried out on the average for three or four years. If such rigid standards are necessary where complete rest of the diseased lung can be obtained, then certainly the standard outlined above where only relative rest is used is none too strict. Certainly the length of time that localized rest is deemed necessary is one of the best arguments for prolonged bed rest. Under this standard then of no change in the treatment as long as the lesion is improving under bed rest as is determined by serial x-rays, the duration of bed rest will vary with each individual patient. Patients with early lesions require a much shorter period of bed rest than those with advanced chronic lesions.

Admittedly there are patients who will improve and even heal without such rigid treatment. As yet we have no test but the trial and error methods for determining the unusual resistance which such individuals possess. So the safest plan is to use bed rest even longer than may be absolutely necessary in any particular case, for in the words of Trudeau, "I know

I have hurt nobody by rest but I am quite sure I often have by allowing them to exercise." Perhaps the fact that most of our patients fall in the far-advanced group and hence need a rather prolonged period of treatment has only served to emphasize the value of prolonged bed rest. For instance, in a recent analysis of 548 patients with pulmonary tuberculosis now in the Sanatorium, Cohen found cavitation, either unilateral or bilateral, present on admission in about 77 per cent. Cavitation was also present on admission in 50 per cent of those discharged in 1925, in 65.8 per cent of those discharged in 1931 and in 66.4 per cent of those discharged in 1932. Many of the patients with unilateral cavitation had disease in the other lung. Also, many of those without cavitation had bilateral pulmonary tuberculosis. Therefore prolonged bed rest may be needed before one lung has improved sufficiently to permit collapse therapy to be used on the other lung.

Some will claim that bed rest over such a long period of time will cause gastro-intestinal disturbances and degeneration of the muscular system. The gastro-intestinal disturbances can be controlled by diet. As for the degeneration of the muscular system, what of it? What are we treating, the muscular system or diseased lung? When the lungs are healed, the muscle tone can be easily restored by proper exercise.

After healing has ceased to progress under the use of bed rest as outlined above and the process has become stationary as determined by serial x-ray films, some other type of treatment is necessary. What this is will depend upon the extent of the healing. If slight, then, depending upon the type of lesion (old fibroid, fibro-caseous or caseous) exercise or collapse therapy is indicated. If marked, and nearly complete, then exercise so regulated as to promote further healing rather than to interfere with it is indicated. This can best be accomplished by using the same standard for increasing exercise as was used in determining when bed rest should be discontinued and exercise begun. That is, while the patient is improving no change in the treatment is indicated. So if a lesion which has become stationary under bed rest begins to heal again under a certain amount of exercise then this amount of exercise should be continued until the lesion becomes stationary again. When it does, of course, exercise should be increased. It is obvious that this stage in the treatment of tuberculosis is a very critical one and any over-exertion or indiscretion on the part of the patient may result in a spread of the disease and a reappearance of symptoms. When this occurs the patient must start his cure all over again. Therefore the physical activities should be kept within the limits which will continue the healing of the process.

If after a reasonable time it is apparent that bed rest alone will not produce the desired results, except after years of treatment, or perhaps never, then it should be supplemented by localized rest such as is secured through the various types of collapse therapy. We have found these procedures necessary in about 58.1 per cent of the 578 pulmonary patients now in residence.

According to Alexander,[1] this type of treatment (collapse therapy) is without doubt the most valuable contribution to the therapy of pulmonary tuberculosis since Dettweiler first introduced rest in 1870. Through it the most favorable conditional requirements for repair of the diseased lungs are secured.

According to Krause, pulmonary compression by means of pneumothorax was practiced by the Hippocratic School in the 5th Century B. C. Except for an occasional worker, it seemed to have been forgotten until its use was suggested again by Carson following the discovery of the elasticity of the lung early in the 19th Century. Carson[7] believed that the elasticity of the lung was the greatest obstacle to healing of the diseased area because it kept the disease tissues apart and in constant motion. He claimed that a lung would heal much more rapidly if the diseased area could be quiet and the inflamed surfaces and cavity walls brought together. He therefore concluded that a splint or some mechanical means should be employed to overcome the elasticity of the lung and suggested pneumothorax. Although this type of treatment seemed very logical to Carson it did not come into common use until twenty-five to thirty years ago. This is greatly to be regretted for without doubt at some time or other the majority of the consumptives who have died have been suitable cases for collapse therapy. Manifestly it should be the duty of every physician who is treating tuberculosis not to let that period pass without grasping the opportunity.

The action of collapse therapy is both mechanical and physiological. The compression atelecta-

sis collapses cavities, controls hemorrhage, and squeezes secretions from the lungs. The immobilization of the lung with the accompanying lymphatic and vascular stasis brings about a reduction of toxemia and greatly favors the healing of the tuberculous process.

Thus one might say that collapse therapy produces a physiological amputation of the lung and gives the body almost if not fully as much relief as does the removal of any purulent area such as an infected appendix, or the draining of a badly infected sinus.

Fibrosis by counteracting the elastic tension of the lung becomes nature's method of producing collapse therapy. To me this is just another argument for the desirability of overcoming this elasticity by some mechanical means and it is just another link in the chain of evidence which points to the value of pulmonary collapse in the treatment of pulmonary tuberculosis.

Collapse therapy is produced by artificial pneumothorax, by paralyzing the diaphragm through interference with the phrenic nerve, or by extrapleural thoracoplasty. Time will not permit more than a brief description of each procedure.

Artificial Pneumothorax.—This is the simplest, the most flexible, and therefore the most commonly used form of collapse therapy. It is indicated whenever bed rest does not produce the desired results and in patients with uncontrolled hemorrhage, large cavities, extensive unilateral disease and less extensive bilateral disease. In many such cases pneumothorax is begun within the first month or even within the first week after admission.

Extensive unilateral disease is the ideal condition for its use but that is seldom found and so it is usually used on less ideal cases.

In the beginning of the treatment small amounts of air are injected into the pleural cavity every other day but gradually the amount of injected air is increased and the interval of time between treatments is lengthened to ten days to three weeks.

The duration of the treatment varies from a minimum of about two years to a maximum of the rest of the life of the patient. The average duration is about five years.

The success of pneumothorax depends largely upon the condition of the pleural space, that is, whether the lung is free or bound down by adhesions, either completely or partially. Under suitable conditions isolated adhesions may be cut after the method of Jacobeus without an open operation, but care must be exercised in this procedure not to cut diseased lung tissue.

One of the complications which interfere with the success of pneumothorax is effusion. This may be large or small, serous or empyematous. This has occurred in 58 per cent of our pneumothorax patients. Other complications are: mediastinal hernia (5 per cent); mobile mediastinum (2 per cent); air embolism in two of 546 cases.

Results.—Pneumothorax was used or attempted in 546 patients discharged from Glen Lake Sanatorium prior to January 1, 1933. It was considered successful in 28.2 per cent even though in 3.5 per cent of this group it was supplemented by some other type of collapse therapy. In 22.1 per cent of the unsuccessful attempts no free pleural space could be found and adhesions or some other complication accounted for 49.6 per cent of failures. Fortunately we were able to use some other type of collapse therapy in 41.2 per cent of this group.

Bilateral pneumothorax has been used occasionally in patients with bilateral tuberculosis who had not improved under ordinary sanatorium treatment or who had shown a spread into the good lung while receiving unilateral pneumothorax. This is a painstaking, arduous procedure which should only be undertaken when the patient can be under very close supervision. We have had sixty-two such cases and of this number only 16.1 per cent could be considered satisfactory. Of this number 24.2 per cent had some other type of collapse therapy.

It should be remembered that this series goes back to 1917 when we first began to use pneumothorax. We believe that our next large series will show much more favorable results because we are using pneumothorax earlier and we have better facilities for the use of other types of collapse therapy.

Phrenic Nerve.—Paralyzing the diaphragm through interference of the phrenic nerve may be a permanent or temporary procedure. Temporary paralysis is usually secured by crushing the nerve. Permanent paralysis is obtained by excising a centimeter or two of the accessory branches as well as the main trunk, or by an evulsion of about 10 centimeters of the distal fragment of the main trunk. In all operations on the phrenic nerve the accessory phrenics must

be also included, or else the desired results will not be secured. This type of treatment is generally used in those patients in whom pneumothorax or thoracoplasty cannot be done or as a supplementary procedure to other types of collapse therapy. With this procedure individualization is necessary and it may be used before or after the other type of collapse. Whenever possible we prefer that it follow the other forms of collapse therapy. Among our patients discharged prior to January 1, 1933, there were 345 who had had 428 operations on the phrenic nerve. About 75 per cent obtained some relief or improvement in symptoms and a few, of course, obtained complete permanent clinical results.

Thoracoplasty.—The last and most radical form of collapse therapy is extrapleural thoracoplasty. This is a major surgical procedure and should only be undertaken by an individual well versed in surgical technic. It is a permanent operation and cannot be discontinued if the contralateral lung should develop a spread. Kinsella believes, therefore, that ideally the lesion in the contralateral lung should have been stationary for about a year before proceeding with this type of therapy. But here again individualization is necessary and so in selected cases this interval may be reduced by several months. It is indicated in those cases in whom pneumothorax is desirable but impossible or when for any reason it seems desirable to discontinue pneumothorax before the lesion is considered healed. It is also indicated in cases of tuberculous empyema because it obliterates the pleural space, thus favoring healing of the empyema. Occasionally thoracoplasty may be used in cases of hemorrhage and to relieve cardiac and respiratory embarrassment due to a marked mediastinal displacement in old chronic fibroid cases. It is contra-indicated in acute and in terminal tuberculosis and in apparently fatal extrapulmonary disease, tuberculous or non-tuberculous, such as advanced renal disease, cardiac disease, cancer, etc.

The operation of choice is the posterior extrapleural thoracoplasty and it is done in two or more stages. Frequently the antero-lateral segments are removed at the second stage of the operation in order to make the upper stage or the operation over the pathological process as radical as possible. In the end, this may be the more conservative procedure in that the more normal lung tissue is disturbed the least and may be not at all. The ideal interval of time between operations is two to three weeks.

Results.—In about 70 per cent of our series of 199 cases up to March 1, 1933, thoracoplasty has proved of enormous benefit. The remaining 30 per cent received little or no help from this type of treatment.

While I have described briefly each type of procedure used to secure localized collapse, all of these procedures may be used on the same patient. There are other procedures which can be used as adjuncts to the three mentioned, such as intercostal neurectomy, thereby limiting costal breathing, scalenotomy which reduces the breathing of the upper portion of the chest, intrapleural pneumolysis, extrapleural pneumolysis or extrapleural apicolysis.

Heliotherapy.—The modern use of the sun's rays as a therapeutic agent is due to Rollier,[8] who, becoming dissatisfied with the results of the surgical treatment of tuberculosis, established the first sanatorium for heliotherapy at Leysin, Switzerland, in 1903. He developed a very careful technic which, with certain modifications, is quite universally used today. The body is divided into zones and a progressively graded dosage of sunlight is given. This schedule is, of course, to be considered only as a basic schedule and individualization must be made in each case. All precautions against overexposure must be carefully observed or toxic symptoms such as nausea, headache, dizziness, and elevation of pulse and temperature will result.

Various types of lamps have been devised in an attempt to carry on the treatment during the winter time and on cloudy days. We prefer the carbon arc lamp because it is the closest approach to natural sunlight which the scientific world has yet devised. Even so it cannot be considered equal to the sun and should never be substituted for it. It should be used when the sunlight is not available, or is not tolerated.

Although heliotherapy was developed for cases of surgical tuberculosis it has, within the last few years, been used to a limited extent in cases of pulmonary tuberculosis also. And why shouldn't it? If tuberculosis is the same wherever it occurs, then the treatment which is so beneficial for one type of tuberculosis should be equally beneficial for the other. If it is not, then the method of applying it is wrong rather than the treatment.

Approximately one-third of our adults receiving heliotherapy have pulmonary tuberculosis, either alone or in combination with their extrapulmonary lesion. With them strict individualization is necessary. The sun schedule is increased much more slowly and the maximum time is usually about one-third of that employed for the extrapulmonary cases, which is one hour. Even that, however, is not rigidly adhered to because the chronic, fibroid cases can receive more sun than can the more active cases. The chest is kept covered until after the fifth day of exposure. If after uncovering the chest there is an unfavorable reaction the chest should be covered again.

We have not found that heliotherapy leads to hemoptysis even in those patients with a history of frequent hemorrhages. We have found moreover that in selected cases heliotherapy is very beneficial in pulmonary tuberculosis. We believe that if we learn more about heliotherapy we will be able to extend its treatment to include still different types of tuberculosis.

In attempting to evaluate this type of treatment we must not forget that it is always combined with rest until the lesion is quiescent or stationary.[4]

Nothing has been said so far about the question of food and fresh air in the treatment of tuberculosis. We believe that a diet adequate in calories, vitamins and minerals for the man in health is suitable for the consumptive. Of course if there is any metabolic disturbance present which would require a special diet if the individual did not have tuberculosis, this diet should be given to the individual who has tuberculosis. At present we are serving about 120 special diets a day, including diets for the diabetic, for the nephritic and any and all other metabolic disturbances which the human flesh is heir to. Because of the chronic nature of tuberculosis and the comparatively long stay of our patients, certain general hospitals in Minneapolis feel that the Sanatorium offers an excellent opportunity for the training of nurses in dietetics and we have an affiliation with them for that purpose.

In the past the value of fresh air has been over-emphasized. The body can receive all the stimulation it needs in a well ventilated room so constructed that it is not too warm in summer and with enough radiation in winter to keep the day temperature at about 65 degrees and the night temperature at about 40 degrees.

All the procedures thus far described for the treatment of tuberculosis have centered about rest. Even heliotherapy is combined with rest, and the various methods for producing collapse therapy are used for one purpose only and that is to bring about a greater rest of the diseased part. Rest, both general and localized, is the foundation for the general management of tuberculosis.

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FIRST INFECTION TYPE TUBERCULOSIS*

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WHAT IS IT?

THE first infection type of tuberculosis (often spoken of as primary tuberculosis and, if in the lung, childhood type of tuberculosis) is a *disease* resulting from the invasion of the tissues which are not sensitive or allergic to the protein fraction of the tubercle bacillus. After entering the body through any portal, the bacilli may be phagocytosed by polymorphonuclear leukocytes which in turn are ingested by large mononuclear leukocytes which may enter the lymph or blood stream and transport them to various parts of the body. In time the mononuclears become sluggish, lose their ameboid movement and lodge in fine capillaries, thus serving as foreign bodies. About each of them there gather many other large mononuclear leukocytes forming the giant cell. Thus, the early stage of tubercle formation, which is the first infection type of tuberculosis, begins.

WHERE DOES IT DEVELOP?

This type of tuberculosis may develop in any part of the body where bacilli find lodgment or where they are transported by leukocytes. The solitary tubercle in the brain is not an uncommon discovery when the proper search is made at postmortem. Likewise, solitary tubercles in other organs are often found. Again, the first infection lesion may develop near its portal of entry, such as an abrasion in the skin or in a tonsil or, if inhaled, in a lung, or, if ingested, somewhere along the digestive tract. Once the bacilli gain entrance to the lymph or blood stream, the phagocytes carrying them will most often lodge in those organs richly supplied with fine capillaries, such as the lungs. Apparently, this is the reason the lungs are said to be the most common site of the first infection type of tuberculosis. Multiple foci may be set up in the body from first infection. Even in the lungs of a single individual, numerous Ghon tubercles may be found; and, in the same body, tubercles representing the first infection type of disease may be seen in other organs.

WHEN DOES IT DEVELOP?

The first infection type of tuberculosis develops when tubercle bacilli first find lodgment and multiply in the tissues. This may be in early infancy, in late senility, or at any intervening time (Figures 1 and 2). Apparently, the one requirement for its development is absence of allergy or sensitiveness to tuberculo-protein.

HOW IS IT DETECTED?

There are now only two fine screens used in the detection of tuberculosis of the first infection type: the tuberculin test and the postmortem examination. The former is the finer of these screens. The positive reaction to tuberculin is due to sensitiveness of the tissues to the protein fraction of the tubercle bacillus. In nature this sensitiveness nearly always results from the growth of tubercle bacilli in the human body. Therefore, when the test is positive, one is safe in concluding that the first infection type of tuberculosis is present somewhere in the body. The postmortem examination, if carefully performed, reveals lesions of the first infection type previously unsuspected unless tuberculin tests have been administered. Some lesions are missed by this examination, however, because of their microscopic size or because they are in parts of the body not ordinarily examined. Ghon found them in 95 to 97 per cent of his examinations. Veterinarians find them by macroscopic examination in 88 to 92 per cent of positive tuberculin reactors on first testing. On subsequent testings the incidence is lower, since too little time has elapsed between infection and slaughter for all of the lesions to become macroscopic in size.

Symptoms are so mild or entirely absent as to be of little or no aid in the detection of the first infection type of tuberculosis.

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HOW CAN IT BE LOCATED DURING LIFE?

In the vast majority of cases its location is not determined during life. However, we have first infection type of tuberculosis is undetermined in the vast majority of cases. Only the complete postmortem examination locates them.

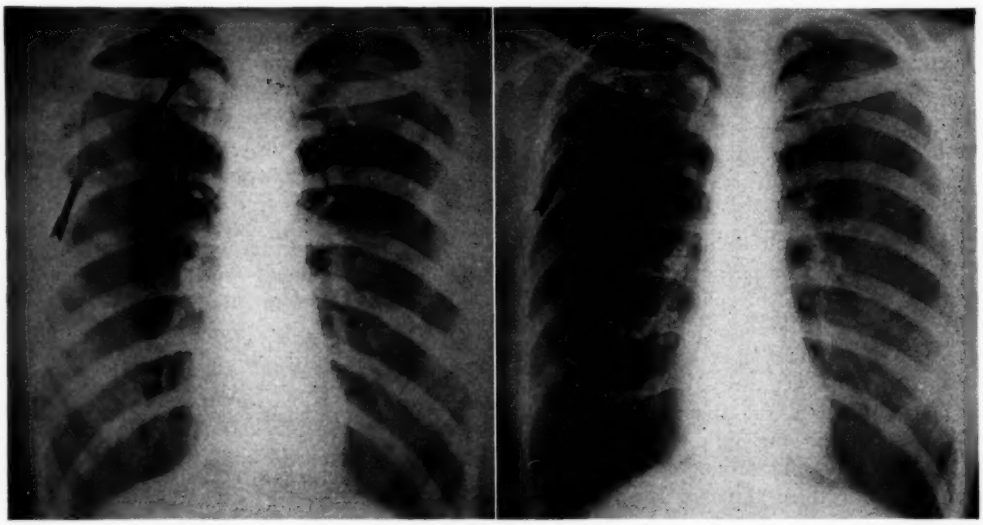

Fig. 1. M. H. B. X-ray film of the chest taken September 21, 1925, of a recent graduate in nursing, aged 26. No history of exposure to tuberculosis before entering school of nursing, June 22, 1922. Shows shadows in the right first and second interspaces, which proved to be first infection type of tuberculosis.

Fig. 2. M. H. B. X-ray film of the same chest (Fig. 1) taken on November 12, 1932. Shows evidence of Ghon tubercle formation in the right second interspace. When the first infection type of tuberculosis is postponed until adult life the reaction of the body is approximately the same as when it develops in infancy or childhood.

means of finding it in a very limited group. Usually, the physical examination is of no avail in any stage of its existence. When one suspects tuberculosis of a lymph node near the surface of the body, the quickest and most certain method of detecting its presence or absence is through biopsy.

One is able to locate the first infection type of tuberculosis by x-ray only in a small percentage of cases. In fact, only in those cases whose lesions in the lungs become quite large during the inflammatory stage and are so located that their x-ray shadows are not obscured by shadows of structures, such as the diaphragm, and those lesions in which sufficient calcium is later deposited to cast shadows visible to the naked eye on the x-ray film can the first infection type of tuberculosis be definitely located. Lesions containing considerable calcium may be detected not only in the lung and hilum but also in posterior mediastinal, mesenteric and cervical lymph nodes.

Thus, during life the location of lesions of the

IS THERE ANY DIFFERENCE WHETHER OR NOT ITS LOCATION IS DETERMINED?

The only reason we do not demonstrate the location of the first infection type of tuberculosis in the vast majority of cases during life is that our methods are too crude; that is, we have no fine screens. In my opinion there is little or no difference between the child who reacts positively to tuberculin and has no x-ray findings of disease and the child who reacts positively and has lesions located by x-ray. The former child may have just as large and just as many lesions as the latter, the only difference being that they are not so located as to be visualized. Again, the lesions in the former child may still be too small to be visualized on the film. Certainly both have foci of tuberculosis. Figures 3, 4, 5, and 6 illustrate two cases: one patient had a positive tuberculin reaction and had foci which could be located on first examination; the other also had a positive tuberculin reaction but no foci were located. Both have developed the reinfection type of disease.

IS IT TRANSMISSIBLE TO OTHERS?

Any tuberculous focus which is discharging tubercle bacilli may be dangerous to others. However, caseous hilum lymph nodes may discharge tubercle bacilli at any stage of the disease even after considerable quantities of calcium have

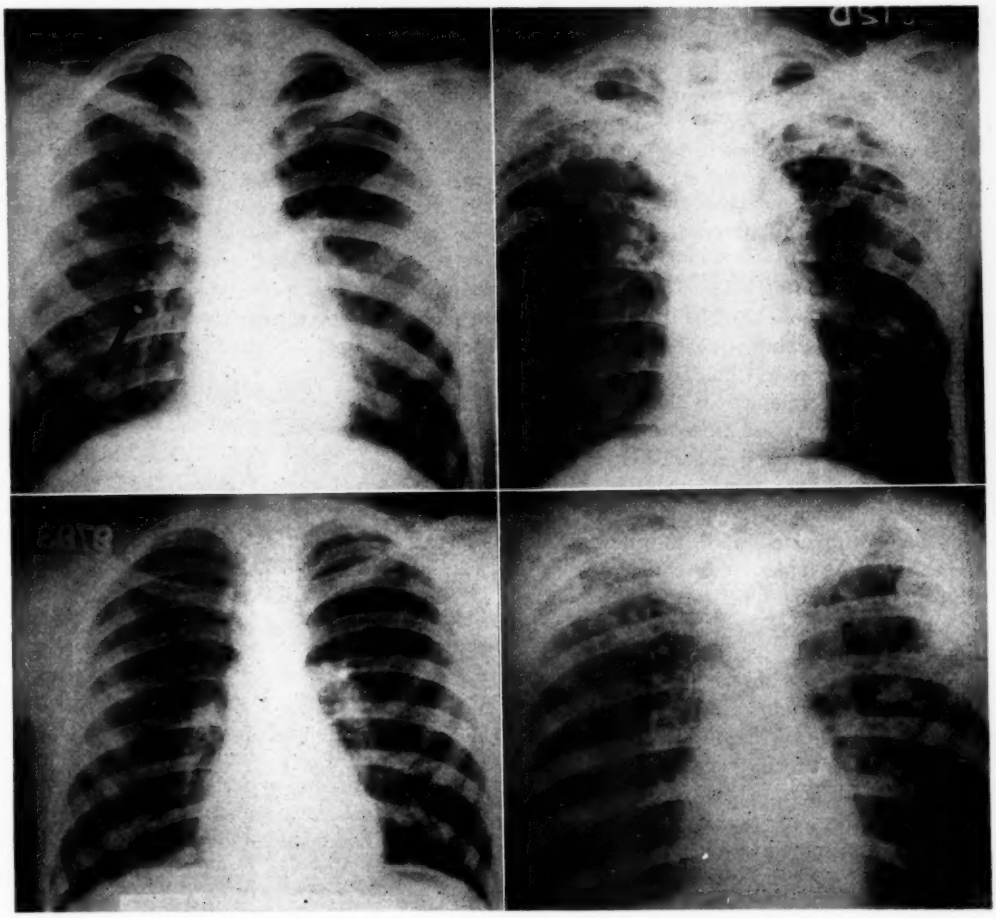

Fig. 3 *(upper left)*. H. P. X-ray film taken on September 19, 1924, of a boy of twelve years. Shows evidence of Ghon tubercle formation on the right side in the third interspace. No other abnormal shadows were seen. The tuberculin test was positive.

Fig. 4 *(upper right)*. H. P. X-ray film taken on October 6, 1932, of the same chest as seen in Figure 3. Shows evidence of far-advanced bilateral pulmonary tuberculosis.

Fig. 5 *(lower left)*. H. J. Film made on October 12, 1928, of the chest of a boy of thirteen years. Shows no evidence of tuberculosis. However, there was history of contact exposure and the tuberculin test was positive, which proved beyond doubt that the first infection type of tuberculosis was present somewhere in the body.

Fig. 6 *(lower right)*. H. J. Film made on March 22, 1933, of the same chest as seen in Figure 5. Shows evidence of extensive tuberculosis involving both lungs. It is obvious that in 1928 the tuberculin test was a much finer screen than the X-ray film. Inability to locate the lesion at that time was of no significance as far as later developments were concerned.

Tubercle bacilli have been demonstrated with considerable frequency in the gastric contents of children who have the first infection type of tuberculosis. Their presence in the stomach contents is dependent somewhat upon the stage of the disease. While in the acute inflammatory stage, bacilli are more likely to be found. However, caseous hilum lymph nodes may discharge tubercle bacilli at any stage of the disease even after considerable quantities of calcium have been laid down in the primary complex. Inasmuch as such children rarely cough or expectorate, obviously, their bacilli usually are not spread to others by way of the mouth. Instead, they are swallowed and eliminated by way of the intestinal tract. While the intestinal excreta may contain tubercle bacilli in abundance, they

are far less likely to be spread to others than through sputum. In the early years of the Lymanhurst activities, patients with cough and expectoration but negative to tuberculin were often admitted. Many of these children were found to be suffering from such conditions as bronchiectasis. Although they were intimately associated with other children in the school, who did have first infection type of tuberculosis, they never became positive reactors. This is good evidence that children with the first infection type of tuberculosis are not a serious menace to others, as long as no bacilli are being discharged.

WHAT ARE ITS CHIEF CHARACTERISTICS?

1. At first, tubercle bacilli are not fixed in the primary focus. Many of them are carried to the nodes which receive lymph from the involved region. They are retained in the nodes where they set up foci of disease almost simultaneously with that of the original focus. Thus, if the primary focus is in a tonsil, the first cervical nodes through which its lymph passes will very quickly become involved; if in the intestine, the first mesenteric lymph nodes which drain the involved area will become tuberculous. Likewise, when in the lung, there is an early dissemination to the regional lymph nodes. The original focus, together with the foci in the lymph nodes draining it, is known as the primary complex.

2. The original focus very quickly becomes encapsulated with fibrous tissue although around it may remain for some time a considerable area of collateral inflammation. Within the capsule caseation occurs. Occasionally the caseous material finds its way into a bronchial ramification, thus leaving a small cavity in the space it occupied. More often the caseous material remains encapsulated, and calcium deposits are laid down within it. At the same time calcium is deposited in the caseous material in the regional lymph nodes. In some cases, calcium and even true bone are laid down in the capsule around the original focus.

3. Throughout the evolution of the first infection type of tuberculosis, there usually is no serious illness. This is true even in cases of rather extensive involvement. For this reason most adults who react positively to tuberculin are unable to state when their first infection type of disease developed.

4. The chief characteristic of the first infection type of tuberculosis is that it renders the tissues of the body allergic or sensitive to tuberculo-protein. This fact makes the tuberculin test our finest screen in the detection of this type of tuberculosis. If the bacilli are all destroyed by the defensive mechanism of the body or become so encapsulated that there is no communication between the focus and the body, the allergy disappears. Otherwise, it probably remains for the lifetime of the individual.

5. Some immunity is said to appear through the development of the primary complex. However, we have no specific test for it. Moreover, it is relative and apparently easily broken down. Therefore, immunity is an uncertain and undependable factor.

DOES IT COMPLETELY HEAL?

The first infection type of tuberculosis does completely heal but in what percentage of cases no one knows. The only person who is entitled to speak of a tuberculous lesion of the first infection type as healed is the pathologist and even he can do so only after careful microscopic study. We speak glibly of healed lesions from the x-ray shadows but there is no justification, scientific or otherwise, for such interpretations and opinions. Evidence of calcium deposits on the x-ray film is by no means definite assurance of complete healing. All that the film shows is the calcium; we are blind to what surrounds it by way of caseous material, etc., and the number of small lesions without calcium deposits in the lymph nodes and elsewhere. Even when a previous positive tuberculin reaction in an individual becomes negative, we cannot be sure that the lesion has completely healed. Perhaps it has only become so well encapsulated that there is no escape of its products to the body.

IS IT A SERIOUS DISEASE?

The first infection type of tuberculosis is a very benign disease. I believe it rarely if ever kills. Usually it causes no incapacity, whatsoever, and any symptoms associated with it pass unnoticed. However, it is a very serious disease in that it produces allergy and may at any time disseminate bacilli to other parts of the body.

WHAT IS ITS RELATIONSHIP TO THE RE-INFECTION TYPE (CLINICAL) TUBERCULOSIS?

The first infection type of tuberculosis always

precedes clinical disease; therefore, it may be looked upon as the forerunner of all destructive forms of tuberculosis. The allergy which it produces apparently gives the tissues the ability to fix tubercle bacilli of re-infection wherever they find lodgment. Around them there is immediately thrown out a polymorphonuclear leukocyte exudate, later followed by a large mononuclear exudate. This acute reaction quickly fixes them at or near the site of lodgment, where they often produce the destructive form of disease. They are fixed so quickly and so firmly that they are not even carried to the regional lymph nodes. Therefore, the body by reason of allergy reacts to tubercle bacilli of re-infection in an entirely different manner than it did to tubercle bacilli of first infection. The reaction to first infection is nearly always favorable while to re-infection it is often unfavorable from the standpoint of its control. Inasmuch as the tendency to progression is due to allergy, we must look upon the first infection type which produced the allergy as a serious disease.

Since the first infection type of disease often harbors living tubercle bacilli for years, and even for the lifetime of the individual, its foci may be likened to test tube cultures of virulent bacilli. As long as the test tube remains intact, the stopper is not removed, and the bacilli do not escape so as to reach the bodies of people, they are entirely harmless. So it is with the cultures in the primary complex in the human body. However, over the test tube cultures we have considerable control, whereas, over the cultures in our bodies, we have little control. We can only trust to our natural defense mechanism to hold them in abeyance. Not infrequently this fails, and bacilli are disseminated to allergic tissues where the destructive forms of disease may develop. If large numbers of bacilli escape into the blood stream or into the subarachnoid space, acute, rapidly fatal, miliary tuberculosis or meningitis results. If they escape into the bronchial tree, chronic clinical pulmonary tuberculosis may result; if into the pleural space or the peritoneal cavity, tuberculous pleurisy and peritonitis develop. The allergy resulting from the first infection type of tuberculosis likewise makes the body liable to clinical disease from bacilli admitted from exogenous sources. The re-infection type of disease may develop from endogenous or exogenous sources any time after allergy is established. Therefore, we see it in infancy, senility, and all intermediate ages. Thus, there is a very definite relationship between the first infection and re-infection types of tuberculosis. The latter cannot develop in the absence of the former.

HOW IS IT CLASSIFIED?

From observations at Lymanhurst, we see no need for an elaborate classification of the first infection type of tuberculosis. In our experience it takes the same course regardless of the part of the lung in which it develops; that is, we see it coming under control slowly but surely with Ghon tubercle formation in the base of a lung, just as in the apex. If we trace the same lesion from the time it appears in the inflammatory stage through to Ghon tubercle formation, we see that it goes through a number of stages, but all a part of the same process. About the only classification we need, therefore, is the following:

FIRST INFECTION TYPE OF TUBERCULOSIS

Always from exogenous sources. Develops any time in life when first infection from tubercle bacilli occurs. May make its appearance in any part of the body but most often in the lungs. Its presence is detected by sensitiveness to tuberculin.

1. *Location of lesion not demonstrable during life.*—In majority of cases the location of the disease is not demonstrable during life because our methods of examination are too crude. Nevertheless, a positive tuberculin reaction is definite proof that the first infection type of lesion is present.

2. *Location of lesion demonstrable during life.*—Such lesions may be near the surface, where they are easily examined and biopsy may be performed. Deeper lesions in the neck, abdomen, or chest may be demonstrated by x-ray film examination. When in the chest, one is able to observe them in the following stages:

a. *Inflammatory Stage.*—Considerable collateral inflammation in the lung parenchyma around the focus of tubercle bacilli. This may be just large enough to cast a shadow visible on the x-ray film or it may involve the greater part of a lobe. The homogeneous x-ray shadow is often mistaken for tuberculous pneumonia. It may appear in any part of the lung. Simultaneously there is enlargement of regional lymph nodes due to tuberculosis but usually they are not visualized on the x-ray film. The shadow usually remains unchanged for many months.

b. *Resolving Stage.*—Shadow loses its homogeneousness by the appearance of clear areas. Entire shadow may finally disappear or there may remain a small area of density around the focus. After resolution begins, many months are required before it is complete.

c. *Calcifying and Ossifying Stage.*—Not all lesions have enough calcium deposited in them to cast visible shadows on x-ray film. In some lesions small densities will first make their appearance on the film and increase in size until one sees a single shadow of considerable size cast by the calcium deposits. True bone is found in 25 to 35 per cent of such lesions. Shadows representing calcium deposits in the regional lymph nodes are often visualized. Calcium deposits may make their appearance in a few months but usually many months or a few years are required.

d. *Stationary Stage.*—After calcium is deposited, the x-ray shadow may appear the same for years or even the lifetime of the individual. However, pathologists have shown that in the immediate vicinity of the focus tubercles are constantly being formed. Calcium deposits may be expectorated, thus removing the evidence from the x-ray film. Again, they may be completely absorbed so the film no longer reveals any evidence of disease. To this stage the terms apparently arrested or arrested may be applied but during the lifetime of the individual the terms apparently healed or healed are never justified. The word "cured," if used, refers only to the objective symptoms of patient.

The classification of re-infection type of tuberculosis into minimal, moderately advanced, and far advanced disease with A, B, and C symptoms is not applicable in the first infection of tuberculosis.

SHOULD IT BE REPORTED TO THE HEALTH DEPARTMENT?

In Figure 7, one sees the course which tuberculosis takes in the human body. Generally speaking, all infants are born free from tuberculosis; therefore, they react negatively to tuberculin at the time of birth. Some will subsequently come in contact with tubercle bacilli and will develop foci of tuberculosis, which will result in sensitiveness to tuberculin. If their foods are contaminated with tubercle bacilli and they come in contact with large numbers of open cases of tuberculosis, approximately 100 per cent will react positively by the time young adult life is reached. In fact, such conditions existed when the early studies were made in Vienna. Obviously, the less the exposure, the greater the number of infants and children who remain negative to tuberculin. In Minnesota and Wisconsin, approximately 70 per cent of the girls and boys of university age are free from the first infection type of disease and, therefore, are negative to the tuberculin test. The remaining 30 per cent (Figure 7*A*) have come in contact with tubercle bacilli, have taken them into their bodies, where foci of tuberculosis have developed. They react positively to the tuberculin test. This is the very beginning of tuberculosis and here is where reporting to the health department should begin. Some from the 70 per cent will become infected with tubercle bacilli through exposure as their years advance. The group of positive reactors will contribute the greater part of the tuberculosis load of the future. Their potentialities are great.

The first infection foci of disease may never be located during life. In a small percentage, however, the x-ray film will show the location of these foci. In Figure 7, these groups are represented by B and C. Some members from Group B will later show x-ray changes representing the first infection type of disease; therefore, they must immediately be transferred to Group C. The potentialities in Group C are again great. The majority of those showing x-ray evidence of disease have only the first infection type, D, but a small percentage have evidence of the re-infection type alone, or in co-existence with the first infection type, E. Whether or not the first infection type is demonstrated on the x-ray film makes no difference; it is present somewhere in every member of Group E. Therefore, Group B, as well as Group D, may at any time contribute to Group E. Those in Group E may be subgrouped according to their stage of re-infection or clinical disease, as seen in F, G, and H. Unfortunately, in the past we have allowed the whole tuberculosis scene to be enacted in the human body before the disease was reported; in fact, it was not until patients or members of the various groups had been transferred to Groups F, G, and H, that they were reported, and a more discouraging fact in Minnesota is that approximately 30 per cent of the cases have been reported for the first time by the death certificate. Patients from Groups F, G, and H are all transferred to Group I, where some respond to treatment and recover completely; others recover only in part, and some die. In every group, beginning with A and ending with I, there is the possibility of endogenous re-infection into the blood stream or into the subarachnoid space. Such members are immediately transferred to Group J, where they die of tuberculous meningitis or miliary tuberculosis. Until we begin our efforts against tuberculosis in the very beginning of its existence in the body, and report all posi-

tive reactors, as well as clinical cases, and treat them accordingly, we can not hope to advance much beyond our present position.

The incidence of positive reactors is so low among children today that the reaction to tuberculin has a significant meaning. If there is no other finding than the positive tuberculin reaction, it would seem feasible to have such cases reported to the health department and carried in a separate file from that of the positive sputum and re-infection cases of tuberculosis. The information so assembled would be of great value in two ways: (1) It would inform the health department that every such case had been exposed, so that a search might be made for the source; (2) it would inform the health department that all such persons are potential cases of clinical tuberculosis and, therefore, should be kept under close observation, particularly during the teen ages and the twenties. A separate file would prevent the stigmata which many people believe would accompany the reporting of such cases in the same manner as we now report clinical cases.

WHAT TREATMENT DOES IT REQUIRE?

Once we allow the first infection type of tuberculosis to develop, we are at its mercy. There is little evidence to show that treatment is of any avail. The body controls the disease under all kinds of living conditions of the hosts. The child with excellent care does not seem to fare any better than the child of the slums. In the early days of our work, we believed that sanatorium treatment was essential for every child with a demonstrable lesion in the acute inflammatory stage. We soon learned, however, that the child who went to a sanatorium did not fare any better than the child who remained at home and took part in the same activities as the other children of the neighborhood. Nor is there any evidence that such children do better in a preventorium than at home. About all we can say for the summer camp in the treatment of these chil-

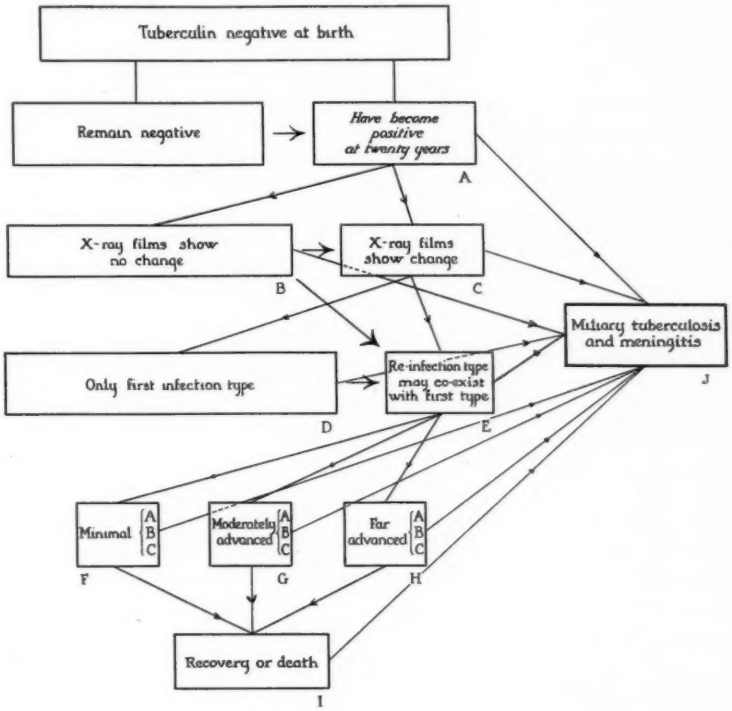

Fig. 7. Diagram of courses tuberculosis takes after the body has become contaminated with tubercle bacilli.

dren is that it may improve their environments temporarily if their home conditions are poor. Camps conducted by luncheon clubs, religious organizations, etc., serve the same purpose as those supported by taxation or Christmas seal funds.

There are certain very definite attentions which must be paid these cases, such as breaking the contact exposure, close observation, and health education. When a child is found to have the first infection type of tuberculosis, as manifested by a positive tuberculin reaction, the first step should be to prevent all further exposure at the earliest possible moment. His tissues are allergic, and the intake of more bacilli may result in the destructive re-infection type of disease. Each positive reactor should be kept under close observation in order that any early manifestation of the re-infection type of disease may be detected. This observation should include x-ray films of the chest annually, or better, semi-annually. The films are not made with a view to detect the location of the first infection type of disease but rather to locate the re-infection type at the earliest possible time when the shadow can be visualized on the film.

The medical and educational work among such children, their parents, and the community, can well be carried on by private physicians. In cities the special school, in conjunction with the supervision of private physicians, is the happiest solution. In such schools a splendid health spirit develops. Rather than occupying beds, the children remain ambulatory and continue their school work, are kept under close observation for symptoms and signs of clinical disease, and have x-ray films periodically. Moreover, their health education work can be carried out in an ideal manner.

HOW CAN IT BE PREVENTED?

There is no satisfactory vaccine or immunization method in tuberculosis prevention work. Although Calmette's vaccine, BCG, has been administered to large numbers in Europe and to a small number in this country, it has not yet been universally accepted. There are two very definite objections to its use which probably can not be overcome if at all in less than a quarter of a century of observation on those to whom it has been administered.

The only satisfactory way of preventing the first infection type of tuberculosis is to prevent contact exposure. Much has been done to remove from communities sources of tubercle bacilli which in years past would have remained to contaminate children and adults. I refer particularly to pasteurization of milk, area testing, slaughter of tuberculous cattle, institutionalization for the isolation of tuberculous patients who can not have satisfactory care at home, and the teaching of thousands of others how to prevent the spread of their bacilli. Case-finding work is in progress, which is resulting in the diagnosis of unsuspected cases of tuberculosis, particularly among teen age girls and boys, teachers, and the older people of communities. Such case-finding work not only detects the open but unsuspected cases but also detects many with lesions which have not yet broken down and which may be treated before they disseminate tubercle bacilli to others. This is preventive medicine of the very highest type, in that it breaks the vicious cycle of tuberculosis. We already have all the facts we need in the control of tuberculosis; that is, if we never have one more fact, scientific or otherwise, added to our knowledge of the disease, we can with sufficient funds and proper coöperation continue to reduce the number of first infection types of tuberculosis, both among children and adults, until within a generation or so the positive tuberculin reactor, even among adults, will be rare.

APPENDICITIS IN THE TUBERCULOUS*

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THE following presentation is a brief review of the literature on tuberculous appendicitis and a preliminary report on appendectomy in patients undergoing treatment for pulmonary tuberculosis.

An analysis published by Rubin of 500 consecutive necropsies in patients suffering from pulmonary tuberculosis showed that in 324, or

*Read before the St. Louis County Medical Society, at Nopeming, Minn., May 10, 1933.

65 per cent, the intestine had macroscopic tuberculosis ulcerations, the appendix being involved in 22 per cent. Fenwick reported that in 2,000 autopsies on tuberculous patients he found the appendix was the only part of the intestinal tract involved in seventeen. Mayo says that at the clinic they always found tuberculosis of the cecum when the appendix was involved. DaCosta, in his text-book of surgery, suggests that the presence of large lymph nodes, so often associated with tuberculosis of the cecum and appendix, would indicate a primary lesion here and that it is in these cases with lymph-node involvement that active cell proliferation, peritoneal fusion and relapse following appendectomy occur.

It appears then from the above observations that the appendix may be the only site of intestinal tuberculosis, or the primary focus of infection, or, more commonly, an accompanying lesion in tuberculosis of the cecum.

There are three types of tuberculous disease of the appendix found. The miliary form found on the serous coating is usually associated with tuberculous peritonitis. The hypertrophic form is characterized by massive formation of dense scar tissue and is associated with the interesting but rare hyperplastic ileo-cecal tuberculosis which causes stenosis of the bowel and simulates carcinoma in signs and symptoms. The ulcerative form occurs in the mucosa, the ulcers having jagged outlines, undermined edges and caseous tissue in the base.

The appendix may become infected by the bloodstream, from adjacent organs or more commonly from the infected contents of its lumen. Various men have reported the incidence of tuberculous infection in all appendices in percentages ranging from 0.44 to 0.65 per cent and that by far the most common cause of appendicitis occurring in tuberculous patients is not the tubercle bacilli but the pyogenic bacteria.

I have reviewed forty cases of pulmonary tuberculosis in which appendectomies were performed. I am not prepared at this time to make any statement in regard to the ultimate effect on the pulmonary lesions.

Eighty per cent of the patients had generalized abdominal pain. Localized right lower quadrant pain was mentioned in 90 per cent of the histories. Nausea and vomiting was present in 48 per cent of the patients.

The fever curves were not studied except to note that none had a temperature higher than 101.3° immediately before operation and only six had temperatures of 102° or over after the operation.

Leukocyte counts ranged from 7,000 to 26,000 per cu. mm., 50 per cent being between 10,000 and 14,000. The anesthetics used were: ethylene, 7; ethylene and ether, 3; nitrous oxide, 1; local infiltration with novocaine, 8; spinal, 18; and not reported, 2.

There were no postoperative exacerbations of the pulmonary condition during the immediate convalescence.

There was only one death in the series and that was attributed to myocarditis.

The pathologic report revealed that two of the appendices were tuberculous, one of these having a superimposed pyogenic infection, which reminds us of the statement made by Cornil and Richelot that a pyogenic infection may cause the tuberculous process to slough out of the appendix.

In only about two-thirds of the cases was a microscopic examination the basis for the pathological report. Scott emphasizes the need of such an examination because macroscopically the true condition may pass unrecognized by the surgeon or the pathologist.

The following conclusions have been drawn after studying this small series:

1. The symptoms of appendicitis in tuberculous patients are clear cut as in non-tuberculous patients. One must beware of making the diagnosis of tuberculosis of the bowel before thinking of acute appendicitis.

2. The anesthetic of choice is local infiltration or spinal.

3. The postoperative course in this group was normal.

4. Appendicitis due to tuberculosis is uncommon even in tuberculous patients.

5. A microscopic examination should be made of the appendix removed from tuberculous patients.

6. The mortality rate from appendectomy is not high in tuberculous patients.

RESERVOIRS OF ECHINOCOCCUS IN MINNESOTA*

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Saint Paul

ABOUT 450 cases of echinococcosis, or hydatid disease of man are recorded for the United States and Canada. When we consider the difficulty of diagnosis, the long period of latency, in some cases as long as thirty years, and the further fact that it is the exception rather than the rule to publish case reports, it is obvious that this parasitic infection is not as rare in this country as is ordinarily assumed.

Supporting evidence of this fact is found in the results obtained by the federal and state meat inspection services. *Echinococcus* infections are by no means rare in hogs, sheep, and cattle. Ransom, in 1915, called attention to the fact that they were being found in alarming numbers in carcasses from parts of Virginia, Oklahoma and Arkansas. They occur in about 5 per cent of the hogs slaughtered in the Municipal abattoir of Baton Rouge, Louisiana, and the manager states that only a few years ago the incidence was as high as 20 per cent.

An astonishing fact, in view of the occurrence of human cases and of those in domesticated animals, is that the adult stage in dogs has been reported authoritatively but once. Cooper Curtice, in 1892, notes "*Taenia echinococcus* von Siebold, very minute, found but once, in a dog killed at the Washington, D. C., pound." Since that time there have been thousands of examinations of dogs for parasites in medical and parasitology laboratories all over the country. Thinking that the record might have been added to by the workers in the Federal Bureau of Animal Industry, I inquired of Dr. M. C. Hall, Chief of the Zoological Division of the Bureau, and was informed that they had not encountered the adult worm except in experimental feedings.

A number of medical workers have explained this on the grounds that the great majority of cases of hydatid disease of man occur in foreign born individuals or in those who have travelled in endemic regions. That this explanation is not sufficient is shown by the frequency of the disease in domesticated animals in this country. There must be widely distributed carriers of the adult worm.

Some very significant findings have been made in the course of a study of the parasites and diseases of Minnesota moose, conducted coöperatively by the Division of Veterinary Medicine and the Division of Entomology and Economic Zoology of the University of Minnesota. In a mature male moose from St. Louis County, autopsied by Dr. C. R. Donham, were found cysts in the lungs which were identified by the writer as those of *Echinococcus granulosus*. Since that time these hydatid cysts have been found in the lungs of five other moose, giving an astonishing total of six infections out of thirteen animals examined for parasites. With one exception the moose were from St. Louis County. The sixth one was from Cook County. Mr. F. G. Wallace, assistant in the Division of Entomology, fed some of these pulmonary cysts to a dog and two months later recovered a great number of adult tapeworms typical of *Echinococcus granulosus*.

Finding these hydatid cysts in animals which notoriously shun the haunts of man indicated that some other primary host than the dog was concerned in the maintenance of the parasite. Attention was directed to the wolf and through the courtesy of Warden Arthur Johnson, of the State Fish and Game Commission, three carcasses of timber wolves from Cook County were secured. Two of these harbored adult *Echinococcus* tapeworms.

That wolves and foxes, as well as dogs, serve as primary hosts for this dangerous worm is known from European records, but I do not believe that these hosts have been implicated before in this country. It is obvious that not only moose but also deer, domesticated animals and man may suffer infections from this source. Human cases may be contracted from eating strawberries, huckleberries, and other contaminated fruits from the region where the primary

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hosts occur. Moreover, it must be recognized that human beings who handle carcasses of wolves or dogs which harbor the adult are liable to infections.

It would seem that deer would play an important rôle as carriers of the cystic stage, although I have had no reports from the United States. I should be glad to examine and report upon suspicious-looking cysts from the liver or lungs of these or other animals.

SARCOMA OF THE UTERINE CERVIX*

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Minneapolis

MYOMATA of the uterine cervix occur less commonly in the uterine cervix than in the body of the uterus. It has been variously estimated to occur in the cervix in 3.5 to 25 per cent of cases, the average in a large series being in the neighborhood of 12 per cent according to Lockyer. The occurrence of carcinoma in the same locations is about reversed. Myomata are stated by Lockyer to be more frequent on the posterior than on the anterior wall, and they usually form an elongated mass which makes the cervical canal four or five times as long as normal. As a tumor in this location enlarges it may fill the pelvis snugly, forcing the fundus up into the abdomen and even at times obstructing the neck of the bladder by pressure against the os pubis. Smaller tumors growing from the cervix may become pedunculated, forming a polypoid type of growth and if this occurs the mass seldom becomes very large.

Sarcomatous metaplasia of a cervical myoma is by no means common. Occasionally sarcoma in this location may develop from a corporeal growth which has extended downward, but more commonly it takes origin from a preexisting myoma. The frequency with which a myoma may become sarcomatous is a matter of considerable practical importance and Masson, Aschoff, McDonald and others have estimated that about 1 per cent of uterine myomata become sarcomatous.

Sarcoma of the uterus occurs most frequently at about the climacteric and anatomically these tumors may be divided into the parenchymatous and mucosal types depending on their point of origin. These sarcomatous growths may resemble myomata, appearing as distinct roundish masses of variable size and consistency in the parenchyma, or they may take origin from the submucosa, become pedunculated and present the symptoms of a polyp. The latter type may invade the mucosa rapidly, and if removed without wide resection of the base there is a marked tendency to recurrence, as one would expect from the histologic character of this tumor. This further emphasizes the fact that all polypi removed from the fundus or cervix, as well as any suspicious lesion, should be subjected to microscopic examination rather than to trust the naked eye.

Myosarcomata are generally regarded as myomata which have undergone sarcomatous metaplasia. This may reasonably be expected from a study of the natural history of a myoma, the cell types of which are fibroblast and leioblast. These cells can easily undergo malignant metaplasia, as demonstrated by a number of investigators.

Grossly a sarcomatous area in a myoma is evidenced by a yellowish homogenous appearance on the cut surface as distinguished from the whorls of a myoma. Cysts and hemorrhages in the malignant area are common. Microscopically the cell nuclei are enlarged, frequently show mitotic figures, and the collagen fibers are elongated to form spindle cells with long intercellular processes. Cullen states that hyaline degeneration and sarcomatous metaplasia are so frequently associated that there probably is a relation between the two. According to him this may possibly indicate decreased vital activity of the cells.

Clinically these tumors may grow little or none at all for a long period and then suddenly show signs of rapid development. Local extension of the growth into the parametrium, peritoneum, or uterine cavity may be early and widespread. In the corpus, sarcoma causes a softening of the uterine muscle so these tumors feel doughy and

*Presented before the Hennepin County Medical Society, April 5, 1933.

somewhat resemble the pregnant uterus. Sarcoma frequently gives rise to a much larger tumor than does carcinoma. Pyometra and hematometra occasionally occur as a result of obstruction in the uterine canal. In the cervix the condition may be extensively developed before symptoms are produced, but when pain is present, it is usually an evidence that the disease has gone beyond the cervix. Lymphatic and blood-born metastases in adjacent glands and distant organs may occur but this is commonly a late phenomenon. Recurrences after operation are practically always local, so that if the growth can be widely resected, prospects of cure are excellent. Whenever a previously benign myoma shows signs of enlarging, especially after the climacteric has taken place, sarcoma should be suspected; and in the presence of ascites, cachexia and loss of weight, malignancy is almost certain. Because of the rarity of sarcomata, however, it must not be forgotten that a uterine tumor associated with irregular bleeding after the menopause is much more likely to be a myoma associated with a carcinoma, than a sarcoma.

Fig. 1. Myosarcoma of the cervix, low power. Moderately cellular type of growth.

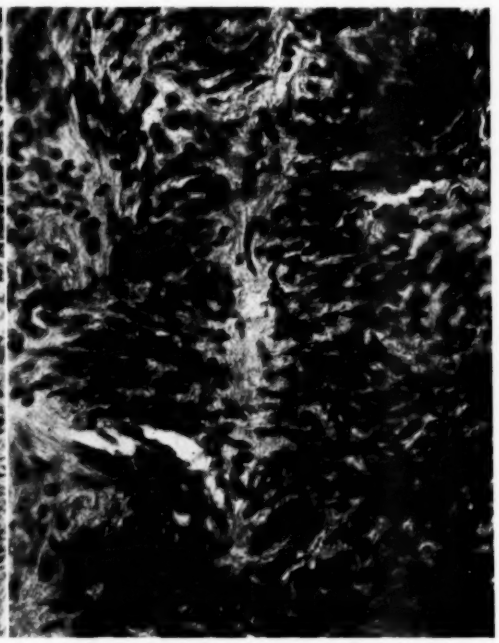

Fig. 2. Same tumor, high power. Increase in number as well as size of cell nuclei.

The prognosis in a rapidly growing sarcoma is very serious, but in some types of lesions such as the fibro- and myosarcomatas, growth is likely to be slow. The round cell type is especially malignant. In those cases treated by radical resection, operative mortality is 4 per cent (Masson).

The treatment in operable cases is abdominal panhysterectomy. This consists in the removal of the uterus and its appendages through a low midline incision, resecting the cervix with a cuff of vaginal tissue so that all gland bearing and adjacent vulnerable tissues are taken away.

Radiation therapy has been warmly recommended but Masson states that in from 20 to 24 per cent of these cases no beneficial results have been obtained. The consensus of opinion is that operation followed by radiation is preferable.

CASE REPORT

A female, forty-six years of age, came for examination January 10, 1933. She had had two normal pregnancies, the last one seventeen years previously, and since then menstruation had taken place regularly and normally. Nephrectomy had been done in 1929 for an acid fast infection in the kidney and since then she had had no symptoms referable to the genitourinary tract.

Her complaints on admission were malaise and general ill feeling for the past two or three months. She had lost no weight and she complained of no definite

pain. There had been a small amount of whitish discharge from the vagina between menses for the past few months, but otherwise no menstrual disturbances had been noticeable.

On examination there were no relevant physical findings except as stated below. The blood pressure in millimeters of mercury was 126 systolic and 84 diastolic. The pulse averaged 76 beats per minute and the temperature was 98.6° F. Hemoglobin concentration of the blood was found to be 78 per cent by the Dare method, and examination of the urine gave negative results. The Wassermann and Kahn reactions of the blood were reported negative. Examination of the cervix through a speculum showed considerable enlargement of the posterior lip due to a hard rounded mass lying deep in the tissues, but presenting no evidence of extension or attachment to any of the neighboring structures. There was no erosion of the epithelium overlying the mass. Bimanual examination of the uterus and its appendages gave no abnormal findings. A diagnosis of probable cervical myoma was made and biopsy and removal recommended.

March 3, 1933, under nitrous oxide and ether anesthesia a small portion of this mass was removed through the vagina. When the pathologist reported the condition to be myosarcoma, preparation for laparotomy was made and the abdomen was opened through a low midline incision. No metastases or evidences of local extension of the growth were made out, consequently the uterus with both tubes and ovaries along with a cuff of vaginal tissue were removed. Peritonealization was accomplished by bringing together in the midline the stumps of the round ligaments over the sutured portion of the vaginal vault. Convalescence was without incident and the patient left the hospital on the fourteenth postoperative day. At present she states that she is in excellent condition (April 6, 1933).

Examination of the specimen removed showed a friable mass in the posterior wall of the cervix measuring 3 by 3 by 3 cm. The cut surface presented a homogenous appearance due to considerable necrosis and hyalinization which had taken place, and microscopically there were present numerous bundles of large cylindrical cells with a few mitotic figures. The pathologic diagnosis was myosarcoma. Two very small myomata were present on the anterior wall of the fundus of the uterus which on gross and microscopic examination proved to be of a benign character.

The evidence in this particular case points to the fact that the myosarcoma developed from a degenerating myoma as shown by the circumscribed somewhat encapsulated local lesion as well as by the presence of several other small myomata in the body of the uterus. The prognosis should be excellent inasmuch as wide resection of the tumor was done and no evidence of either extension or metastases were present. The marked tendency of myosarcomata, no matter where its location, to recur after local removal has been emphasized elsewhere (Rankin and Larson). However, in most of these cases by means of wide resection before extension or metastasis have taken place, permanent cure can be expected.

1737 MEDICAL ARTS BLDG.

FUADIN

The Council on Pharmacy and Chemistry reports that Fuadin is a complex trivalent antimony compound (sodium antimony^{III} biscatechol-disulfonate of sodium), distributed by the Winthrop Chemical Company. It is marketed in the form of a solution, in ampules containing about 6.3 per cent of the drug and representing about 8.5 mg. of antimony per cubic centimeter. It is proposed for use in the treatment of bilharziasis and granuloma inguinale in place of antimony and potassium tartrate, and is administered in doses of from 1.5 to 5 c.c. until a total of from 40 to 45 c.c. has been given. The Council's Committee on Nomenclature felt that the selection of the name Fuadin (named after Fuad I, King of Egypt, because of his interest in the product) is regrettable. However, it was not found technically in conflict with the Council's rules and, since the firm for practical reasons hesitates to give it up, the Council voted to recognize it. Fuadin was synthesized by H. Schmidt of Elberfeld for use in the treatment of bilharziasis. The pharmacology has to some extent been elucidated by Hammuda of Cairo and Weese of Elberfeld, who found the compound safe in therapeutic dosage. No data on toxicity and excretion were found in the published literature. Khalil and his co-workers have treated a large series of cases of bilharziasis with Fuadin with reported excellent results, and claim it to be superior to antimony and potassium tartrate in that it may be administered intramuscularly, side actions are less pronounced, and the course of treatment may be shortened. The use of Fuadin in granuloma inguinale is still in the experimental stage; the data presented in the paper of Williamson et al are incomplete and must be supplemented by more complete reports before the therapeutic usefulness of Fuadin may be considered to be established. No information was available to the Council's referee as to the effects of Fuadin on the kidneys. As antimony compounds are known to be renal irritants, caution is indicated until this phase of the problem has been properly elucidated. As a result of its consideration of Fuadin, the Council held that the use of this drug in granuloma inguinale is still in the experimental stage and that great caution is necessary in its use. The Council postponed further consideration of the product until confirmatory evidence for its therapeutic value becomes available. (Jour. A. M. A., May 27, 1933, p. 1685.)

MANAGEMENT OF AMEBIC DYSENTERY

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IN endemic centers of Endameba histolytica infection, treatment is begun immediately in any patient presenting dysenteric symptoms, even though the organisms are not found by laboratory examinations. The frequent association of the dysentery bacillus may prevent the identification of the Endameba histolytica but specific therapy directed against the latter often permits the recognition of the smaller vegetative transition forms after four to five days.

Practical measures to be adopted in the treatment of amebic dysentery are the following:

1. Complete bed rest. This applies in most cases as patients usually present themselves with acute primary or relapse forms of the disease. Protection is thus partially assured against further exhaustion and any toxic effects of medication. A bedside commode or, preferably, a bedpan is used entirely; concurrent disinfection of the feces and soiled articles is observed.

2. Emetine hydrochloride should be given subcutaneously in daily dosage of 0.04 Gm. (gr. ⅔) for seven days. In sporadic cases occurring in non-endemic areas this would begin only after identification of the histolytica in the stools. For all practical purposes, such identification is made on seeing actively motile ameba containing ingested red blood cells. Quick response to emetine will decrease the number of vegetative forms after a few days treatment. Daily microscopic examinations of stool specimens have only academic interest during the first two weeks of the treatment course. A word of caution: dosage of emetine is sometimes recommended to the extent of 0.10 Gm. (gr. 1½) daily for ten to fourteen days or longer. This invites depression and paralysis of the heart as noted by shortness of breath and marked cardiac arrythmia, gastrointestinal irritation and acidosis. Elderly patients or those suffering from circulatory disease should be watched carefully. Intramuscular injection of emetine is exceedingly painful (personally verified); intravenous administration of 0.03 Gm. (gr. ½) is rarely used in acute fulminating cases but is inadvisable.

3. Bismuth subnitrate or subcarbonate is very effective in large, heaping teaspoonful doses every four hours for seven to ten days. The powder is given suspended in warm water in the first few days; after that in hot milk. The drug may be administered also during the first few nights, which are usually sleepless ones for the patient because of frequent stools and tenesmus. The subnitrate is better tolerated, more available and economical than the bismuth emetine iodide, from which patients complain of slight purging, nausea and vomiting. Personal experience bears out this point.

4. Diet during the first four days of the acute stage is chiefly liquid, consisting of well-cooked vegetable soups at frequent intervals, tea sweetened to the limit; then hot milk, cream soups and farinaceous foods.

5. Ipecac in salol-coated pills is begun at the entrance to the convalescent stage with cyst-laden stools. Ten pills of five grains each are given at bedtime each night, for one to two weeks. The salol covering is pierced by a needle before use to permit intestinal disintegration and to avoid more than three pills being passed in the stool each day.

6. Yatren may be given by mouth (gr.VI. t.i.d.) and concurrently by rectum (200 c.c. 2.5 per cent retained for two hours) if indications point to lesions in the lower bowel. A cleansing enema of 2 per cent sodium bicarbonate precedes the yatren retention. Yatren, like ipecac, is only mentioned, not recommended.

7. Arsenicals are to be preferred for the clearing up of the histolytica carriers. Ipecac and yatren occasionally succeed where neoarsphenamine, stovarsol or treparsol fail, but the contrary is more often true. Arsenic tonic effects are also to be kept in mind, as well as its toxicity. Neoarsphenamine is given intravenously (0.3 Gm.) every third day until ten injections are reached. Stovarsol or treparsol is

†Dr. Rock has had five years' medical experience in Central America, Panama and Brazil, where amebiasis is prevalent.

given by mouth in doses of 0.25 Gm.t.i.d., for a week; then once daily for two weeks. I have seen several patients that showed cysts in the stools for six months in spite of all other forms of treatment, become cyst-free within a week after combined neoarsphenamine and stovarsol therapy. Latterly, treparsol appeared more efficient than stovarsol.

8. Complications will be minimized by a careful note of any fever rise or leukocytosis; thus a pre-suppurative hepatitis is found early. When a patient becomes cyst-free, he is instructed to be on the lookout for any period of fever and during the first year to report every three months for stool examination.

9. Patient's environment. The room is screened, as flies commonly spread the disease by feeding on cyst-containing feces and can pass cysts through the intestinal canal within five minutes and deposit them on ready-to-eat food. It is to be noted that houseflies may be seen about heated buildings in late autumn in Minnesota. In the acute stage, more than the bedpan alone should be considered contaminated, as the resistant cysts may even be carried in dust to lodge on unprotected foodstuffs. The practitioner's responsibility does not end with care of the individual under observation. Usually a latent case can be found in the family, especially when history indicates exposure to a common source. One should early adopt the habit of stool examinations of other members of a household, food-handlers first, when a patient's condition is first diagnosed. It is rather wasted effort to return him after treatment to become re-infected by a symptomless histolytica carrier of the household. Efforts in the direction of family examination are frequently appreciated by all members.

SULPHARSPHENAMINE: ITS USES AND LIMITATIONS

For some years the Council on Pharmacy and Chemistry has considered the question of the high incidence of untoward reactions from sulpharsphenamine as compared with other arsphenamines. In 1925 a paragraph of warning was included in the description of the drug appearing in the current edition of New and Non-official Remedies. Recently question was raised as to whether, in view of the admitted danger from the use of sulpharsphenamine, it should no longer be recognized by description in New and Non-official Remedies. In order to obtain guidance in the matter, the Council sent a questionnaire to sixty-one dermato-syphilographers in the United States. In answer to the first question: "Do you regard sulpharsphenamine as more toxic than the other arsphenamines?" 42 answered "yes," and 9 "no." To the second question: "Are you continuing the use of sulpharsphenamine in your clinic?" 16 answered "yes"; 9 replied that they were using it in a very limited manner; 27 answered "no." To the third question: "Do you believe that the Council on Pharmacy and Chemistry would be justified in withdrawing this preparation from further recognition in New and Non-official Remedies, because of its greater tendency to dangerous reaction?" 28 answered "yes," 2 gave a questionable answer, and 22 answered "no." In view of the diversity of opinions and the considerable group of men who still feel that sulpharsphenamine has a place in the treatment of syphilis, the Council decided for the present to retain sulpharsphenamine in New and Non-official Remedies but to revise the description of the drug to give a more detailed warning concerning the dangers and limitations of its use. (Jour. A. M. A., November 12, 1932, p. 1688.)

THE "MODERN INSTITUTE" FRAUD

The Modern Institute, 381 Fourth Avenue, New York City, sold through the United States mails a so-called Triple-Action System for reducing persons suffering from obesity. Victims were obtained through advertisements published in magazines. The three preparations referred to in the advertisements were further described as: (1) "Triple-X Saline Salts, (2) "Triple-X Venus Cream," and (3) "Triple-X Baths." When these preparations were analyzed by chemists in the Food and Drug Administration of the Department of Agriculture, the Triple-X Saline Salts were found to contain tartaric and citric acids, soda, epsom salt and Rochelle salts. The Triple-X Bath Salts contained tartaric acid, soda and potassium phosphate. The Venus Cream was merely a vanishing cream with the odor of camphor. The directions were to put one-half teaspoonful of the Triple-X Saline Salts in a glass of hot water before breakfast. One of the Triple-X Bath Tablets was to be put in a bathtub containing water as hot as the victim could bear it, in which she was to remain fifteen minutes. The Triple-X Venus Cream was to be used as a massage cream. The amount of material sent in the "special introductory" treatment, for $1.95, was ridiculously small, and shortly after the victim received it she got a circular letter, signed "Florence Kingsley," explaining that she could not expect very much reduction from the small amount of material obtained in the introductory treatment. The main thing was to "keep up the treatment faithfully." The whole thing was an obvious and patent swindle, but it was necessary under the law for the government to go to considerable trouble and expense in introducing medical testimony to prove that it was a swindle. On July 24 Postmaster-General Farley issued a fraud order closing the mails to the Modern Institute, Inc., Modern Institute and Florence Kingsley. (Jour. A. M. A., October 7, 1933, p. 1170.)

PRESIDENT'S LETTER

TO the Members of the State Medical Association:

A year has passed and my tenure of office as president of this Association is nearly at an end. The experience has been a very pleasant one. I have met many old and made many new friends in my trips about the state in the interest of the organization.

I am impressed with the necessity for the medical profession to maintain a strong organization for the promotion of the best interests of the public health. It is my earnest hope that the future presidents of this organization will have the same fine spirit of loyalty and coöperation which it has been my pleasure to find among the officers and members.

I wish to bespeak for Dr. Savage, the president-elect, the same courtesy and good will that I have received from the membership. and wish him a most successful administration.

In closing, let me express my deep appreciation to all of you for your many kindnesses during the past year.

Yours very truly,

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

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AMEBIASIS AND A CENTURY OF PROGRESS

By now the national and perhaps international spread of amebic dysentery from the fair at Chicago is well known. The profession throughout the country should by now be ameba-minded and doubtless will have reason to stay ameba-minded for some time to come.

Usually from one to ten cases of amebic dysentery are reported yearly to our State Board of Health. A number are usually reported by the Mayo Clinic, which draws numerous out-of-state patients. This year there seemed to be no increase in the number of cases of amebiasis in the state until late this fall when six cases of amebic dysentery were reported from the Miller Hospital, Saint Paul, in a period of three weeks following the report of the first two cases on October 23. All of the six patients had been to Chicago a short time before becoming ill. Two additional cases have been since discovered in the families of these patients. Since June, eighteen cases have been reported by the Mayo Clinic, but only three of the eighteen are Minnesota citizens. The fact that there has been no increase in the reported cases of amebiasis throughout the state aside from the two localities mentioned seems significant. The conclusion seems justified that amebiasis is not being diagnosed.

This issue of MINNESOTA MEDICINE contains a communication from Dr. Ikeda calling attention to the cases of amebiasis detected at the Miller Hospital. A special article on the treatment of the disease by Dr. Rock, who has had considerable experience with the disease, also appears. The chronicity of the disease, its serious complications and its infectiousness simply emphasize the importance not only of diagnosing the acute case but of detecting carriers.

It seems remarkable that the presence of a serious epidemic emanating from Chicago should have been discovered in Minnesota before any news of the situation was received from the health authorities there. The questionnaire was of no use to those unfortunate individuals who contracted the disease as it contained no intimation of the nature of the epidemic. It does seem as though the medical profession should have been warned of the situation long before it was, so as to be on the lookout for symptoms of amebic dysentery, a warning which might have saved numerous lives.

CONCERNING PRIMARY TUBERCULOSIS

One of the encouraging aspects of medicine is that, every so often, some courageous soul comes forth with ideas and opinions quite opposite from currently accepted views which at first may call forth indignant protests but eventually lead to a sober revaluation of older concepts or to a heightened conviction that these older concepts remain sound. Such opinions are expressed in an article by Myers in this number of MINNESOTA MEDICINE (page 735).

One reads through the paragraphs answering the first seven questions and finds nothing that clashes with what has been taught and accepted

for many years with the exception that the author would classify as *disease,* on the basis of a biological reaction, what in the big majority of us amounts to a pathological accident of no consequence. In the eighth paragraph, however, appear assertions which must be seriously questioned. The doubtful tone in which immunity following primary tuberculous infection is referred to, its "uncertain and undependable" qualities arouse not indignant protest but thoughtful consideration. If it were true that positive reactions to intradermal tuberculin signify *only* first infection and that the adult type of tuberculosis represents second infection then Myers' thesis must stand. But where is the evidence to support this contention? Is it conceivable that those of us who go through life with only a positive Mantoux test or perhaps also with calcification in lung parenchyma or regional nodes or both have received only one infective dose with the tubercle bacillus? Isn't it more likely that in the present order of things with rapid transportation, congestion in urban centers, etc., that most of us have not one but many contacts, not too frequent nor too massive, with the tubercle bacillus? And if this be true, which appears reasonable, then it follows that though we become allergic, the malignant possibilities of allergy in most of us are completely obscured by acquired resistance to reinfection. This, of course, is fully substantiated by experimental evidence and the experience of the white race for generations. If the reverse were true our mortality rate from tuberculosis would be ghastly.

Myers' views regarding the reporting of those having only positive Mantoux tests to the health authorities raises pertinent questions. To report such individuals as having tuberculosis may seriously affect their obtaining employment and insurance. It may also have unpleasant reactions in one's social contacts. The theory behind the suggestion is sound, however, because area testing with tuberculin with x-ray examination of positive reactors, if done thoroughly and repeated over a period of years is bound to bring about a reduction in mortality and morbidity and the incidence of tuberculous infection as well. If this work is to be done by local health authorities it will mean a marked increase in their budgets. If sufficient funds are not available to investigate thoroughly and follow up reported positive reactors obviously a useless mass of data would be accumulated. Furthermore as Myers points out much remains to be done to induce certain physicians to report actual cases of clinical tuberculosis. With 30 per cent of such cases in this state being reported for the first time as deaths, it would seem futile at this time to attempt the reporting of those having only positive tuberculin reactions.

One is somewhat dismayed concerning the pessimistic views expressed by Myers regarding the efficacy of treatment for this first infective type of tuberculosis. No one will doubt that for the vast majority no treatment is necessary. But there is a certain number of children, small it is true, who have been heavily infected and whose home conditions preclude anything resembling hygienic living. The preventorium idea for these children must be sound providing, as it does, breaking contact and affording an environment for twenty-four hours a day which is as close to an ideally health producing one as is possible to achieve. Satisfactory evidence for this contention may never be forthcoming as the difficulties of observing groups similar in all respects for control purposes are obvious. It may be true that the arguments in favor of preventoria for the type of child alluded to, rest entirely upon an empirical basis but it is also true that empiricism backed up by close observation, wide experience and sound judgment is still a potent force today in the practice of medicine.

E. K. G.

FEDERAL EMERGENCY MEDICAL RELIEF

Considerable interest has been aroused in our state as a result of the announcement of the availability of Federal funds for medical expense in Minnesota.

According to a rule promulgated June 23 by the Federal Emergency Relief Administration state relief administrators must provide adequate medical service as well as food and fuel to those on the relief rolls. The rules adopted were published in full in the *Journal of the American Medical Association* (September 23, 1933, page 1026) and the Rules and Regulations as adopted in Minnesota were sent last month to each member of the State Association.

It should be understood that these funds are available for the payment of medical fees only in the counties which receive Federal aid. So far, twenty-nine counties have been receiving this aid, although some nine more have applied and will probably be added to the list in the near future. St. Louis County at present is not receiving any aid. Ramsey County and the city of Minneapolis receive supplementary Federal aid but are not included in the counties in which physicians will be able to collect for services rendered the indigent.

In the thirty counties receiving Federal aid the distribution of funds is handled by the County Emergency Relief Committee composed of two members of the Board of County Commissioners, two members of the Child Welfare Board and a local citizen of wide acquaintance. The State Board of Control sends a paid county relief worker to each such county to assure uniform operation.

It behooves a physician who resides in any

of the counties receiving Federal aid (listed below) and who wishes to participate in this emergency program to submit his name to the County Emergency Relief Committee and to familiarize himself with the regulations sent him by our State Medical Association secretary.

It is obviously impossible for the Federal government to pay all medical fees, even at a reduced rate, for those unable to pay their doctors' fees. Counties able to provide in large measure for the medical needs of their citizens are not included in the program, which is admittedly a temporary emergency measure. A physician signifying his willingness to accept discounted fees for his services makes such agreement between himself and the Board of Control. The fee schedule has not been officially approved by the State Medical Association, and it has not been deemed advisable for the local county society to approve the schedule. It should be understood that the program is a temporary emergency measure and the fee schedule, which apparently is greater than in some states and less than in others, is not a permanent arrangement.

The counties which at present (November 17) receive Federal aid are:

Aitkin, Anoka, Becker, Beltrami, Benton, Big Stone, Carlton, Cass, Chippewa, Clearwater, Cook, Crow Wing, Hubbard, Isanti, Itasca, Kanabec, Kittson, Koochiching, Lake, Lake-of-the-Woods, Mahnomen, Marshall, Mille Lacs, Norman, Otter Tail, Pine, Roseau, Stearns, Traverse.

THE HENNEPIN COUNTY TUBERCULOSIS ASSOCIATION'S NEW PLAN TO AID EARLY DIAGNOSIS

Great strides in the treatment and prevention of tuberculosis have been made in the past two decades. The death rate has been cut from 202 to 72 per hundred thousand, due, largely, to refinement in methods of treatment and a better understanding of the nature of the spread of the disease. But the incidence of tuberculosis is still very high. In the light of our present knowledge it is questionable whether we will make any further marked progress against the inroads of this disease on the basis of treatment and prevention.

The National Tuberculosis Association and many scientific centers are directing their efforts at this time to finding some vulnerable point of attack on the tuberculosis germ with the possibility of developing a direct method of exterminating it in the human body. However, until something of this kind is available, we must look for further reduction in the incidence and mortality rates of tuberculosis to the development of a more acute interest on the part of physicians and the public, in the early detection of the disease.

Early diagnosis of tuberculosis presents an opportunity for the profession to do much toward further reducing the death rate and lowering the incidence of the disease. Much confusion prevails in the minds of the public, and, to a large extent, in the minds of the profession, relative to the merits of the use of tuberculin tests in the discovery of tuberculosis. Much of the present erroneous conception is due to early reports of the large percentage of the population which would react positively to the tuberculin test. The statistics which have formed a basis for these obviously wrong conclusions were based on results of testing with impure tuberculin which gave many foreign protein reactions and was not particularly specific for tuberculosis. Today with the refined Old Tuberculin and the more delicate methods of testing, such as the Mantoux test, in dilutions 1-1000 or 1-500, a positive reaction to tuberculin has definite significance, and furnishes one of the best and surest methods we have in the early detection of this disease.

A limited survey in Hennepin County disclosed that only a relatively small percentage of physicians have been using Old Tuberculin in their offices as a method of diagnosis. At the same time, statistics show that a very high percentage of the cases of tuberculosis reported are far advanced when discovered.

In an effort to stimulate interest in the early diagnosis of tuberculosis, the Hennepin County Tuberculosis Association has developed a service to the physicians of Hennepin County in which they have furnished to the doctors a tuberculin syringe, with needle, and the diluted Old Tuberculin in a sterile vial, thus placing in their hands the facilities necessary for making the Mantoux test. This service includes delivery to the physicians in their offices a fresh supply of diluted tuberculin once every two weeks, which, even without refrigeration, insures physicians a normally reacting tuberculin.

Simple but complete instructions are being given physicians regarding the method of application and of reading the Mantoux test, and it is planned by the Tuberculosis Association that, from time to time, interesting material relative to the value and importance of Mantoux testing and its relation to tuberculosis will be furnished the physicians of Hennepin County. As soon as the doctors show that they are interested in using the tuberculin test, the Association will put on a country-wide educational campaign calling the attention of the public to the importance of the tuberculin test and the x-ray in the early diagnosis of tuberculosis.

The Minneapolis Health Department and Glen Lake Sanatorium are coöperating in carrying out this very meritorious program which has the endorsement of the County Medical Society.

It is to be hoped that this type of service will be made available to practising physicians in

other counties, and possibly, in time, throughout the state by our tuberculosis associations.

Great credit should go to the Hennepin County Tuberculosis Association, which is entirely supported by the sale of Christmas seals, for initiating and carrying on what promises to be one of the outstanding forward steps in the age-old fight against this disease which has resisted so tenaciously every effort on the part of science to eliminate it. N. O. P.

WILLIAM BEAUMONT

In view of this year marking the centennial of the publication of William Beaumont's "Experiments and Observations on the Gastric Juice," it seems fitting to record at this time an apparently unknown Beaumont item, and to list the Beaumont material in the library of the Ramsey County Medical Society.

Some years ago Miss Caroline Beaumont of this city presented to the late Dr. Arthur Sweeney a copy of the second edition of Beaumont's work, Burlington, 1847, and two copies of a pamphlet of twenty-four pages, 18.5 by 11.5 cm. with the following title:

ON DYSPEPSIA

AN ADDRESS
DELIVERED BEFORE THE
CLINTON COUNTY MEDICAL
SOCIETY
AT THEIR
ANNUAL MEETING
June 28, 1831

BY S. BEAUMONT,
President of the Society.

PUBLISHED BY ORDER OF THE SOCIETY,
PLATTSBURGH:
F. P. ALLEN, PRINTER.
1831.

The second edition of Beaumont's work had an additional interest in that it was a presentation copy, having on the second blank leaf the inscription "For J. I. Beaumont from his father, S. Beaumont."

In the pamphlet above described Samuel Beaumont makes no reference to William Beaumont or to St. Martin. This is difficult to account for unless he did not realize at the time the importance of the observations. Mrs. O'Brien states that her father remembered St. Martin, having seen him in Plattsburgh, and having looked into his stomach and also held the basin when observations of the fistula were made. J. I. Beaumont was then a small boy.

The above items were presented by Doctor Sweeney to the Ramsey County Medical Society which also has a copy of the first edition of Beaumont's "Observations," Plattsburgh, 1833, and the recent reprint of the same. *The Medical Recorder* for 1825 containing the preliminary account of St. Martin's injury may also be found in our library.

Miss Beaumont, now Mrs. Henry J. O'Brien, is the daughter of the Joseph I. Beaumont above mentioned. J. I. Beaumont was born in Plattsburgh in 1827 and died in Saint Paul in 1904.

The Society also has two ambrotypes of Dr. Samuel Beaumont and his wife, presented by Mrs. O'Brien, and photographs of two portraits of her grandparents painted at an earlier date, the original portraits being in Mrs. O'Brien's possession.

The second copy of the pamplet mentioned above was acquired from the Ramsey County Medical Society by Dr. John F. Fulton, Professor of Physiology at the Yale Medical School.

J. M. ARMSTRONG, M.D.

MISCELLANEOUS

DOCTOR HOWARD McILVAIN MORTON

The Minnesota Academy of Ophthalmology and Otolaryngology on October 13, 1933, bade farewell to Dr. Howard McI. Morton. He it was who had founded the organization and had been its most colorful member. When one first heard about him he was impressed by his middle initial; when he saw him he noted the black tie with wing collar, the starched shirt, and the vest that was of different cloth than the coat. The way he held his cigar, and his confident manner suggested an acquaintance with important places and people. When we heard him speak for the first time we worried a little about his ability to complete properly some of the long sentences he likes to start, but as happens so often, we worried for naught. After that we looked forward to his dissertations, and were not often disappointed, for at almost every meeting of the Academy he discussed at least one paper. No one else spoke in the polished, scholarly style that he commanded, and few others could relate so many personal experiences with European clinics and professors in his field of ophthalmology.

These are impressions of one who had only a passing acquaintance. Others, more intimate with him, have spoken of his great capacity for making friends, and this is quite apparent, for he does have a host of them. We know, too, he is sincere when he says he loves his friends.

Dr. Morton is giving up active practice, and is going to New Jersey, where he will continue his writing and his literary investigations.

C. W. R.

—*Bulletin* Hennepin County Medical Society, Oct. 25, 1933.

OF GENERAL INTEREST

Dr. Vernon L. Hart, formerly surgeon in charge of the Division of Orthopedic Surgery of the University of Michigan and the Dayton Clinic, is continuing the practice of the late Dr. Emil S. Geist in Minneapolis.

Dr. Merlyn J. Lindahl has moved from Winthrop, where he has been in practice for the past five years, to Jasper, Minnesota, where he will engage in a general medical and surgical practice.

Dr. Earl R. Carlson, formerly of Minneapolis and a graduate of the University of Minnesota, has announced the opening of a country school in Sunny Ridge, New Rochelle, New York. Dr. Carlson specializes in neurology and training of the birth injured.

Dr. John A. Pratt of Minneapolis has returned from Dallas, Texas, where he was the guest speaker before the Dallas Academy of Ophthalmology and Otolaryngology. Dr. Pratt gave a dry clinic in the afternoon of the meeting and in the evening delivered two papers, "Revaluation of Intranasal Surgery" and "The Endocrines in Otolaryngology."

Dr. A. E. Olson of Duluth is one of the newly appointed regents of the University of Minnesota. Dr. Olson was born in Duluth, attended the grade schools in that city and received his pre-medical education at the University of Minnesota. His M.D. was obtained at the University of Illinois, Chicago, in 1920. After taking his internship at Cook County, the Chicago Lying-In and the Grant Hospitals, Dr. Olson began practice in Duluth in 1922.

The Hennepin County Tuberculosis Association, with the endorsement of the Hennepin County Medical Society, is the author of a plan to promote the discovery of more cases of tuberculosis in the early stages of the disease.

Minneapolis physicians will each receive a tuberculin syringe and, every two weeks, a supply of fresh Mantoux testing solution. The syringe is the gift of the Hennepin County Tuberculosis Association. Physicians will be urged to coöperate in seeking the early case by routinely tuberculin testing all patients.

In a letter to physicians, announcing the plan, it was pointed out that of all cases of tuberculosis reported, 50 per cent of these individuals are dead within six months.

At the Abbott Hospital staff meeting in November Dr. David Siperstein gave an informal talk on medical conditions in London. He showed there some of the books which he brought back with him. One was a copy of Osler's "Æquanimitas" inscribed by Osler to Sir Ronald Ross, who established the fact that malaria is carried by the Anopheles mosquito. There were also two books from the original Sydenham library: one, the works of Hippocrates, and another on the medieval plagues. A bookplate printed in early Latin script has been translated here with some difficulty as follows:

"E. C. Van Leersum owns this book. I here earnestly pray to all in the name of Christ that no wicked one take this book from me, neither by force nor by theft nor for any false hunger because to me the greatest wealth is not so precious as my dear books."

It was found that the leaves in the books of Mr. Van Leersum's library had never been cut.

PLANS FOR A CHRISTMAS HOLIDAY CLINIC AT THE UNIVERSITY OF MINNESOTA

Plans are being drawn with the hope of offering a two-day clinic, free, to the physicians of the State, at the University of Minnesota, during the week of the Christmas holidays. It is expected that a program covering subjects of interest to practitioners can be completed during the month of November and upon completion a copy will be sent to the secretary of each local medical society. Information will also be furnished the secretary of the State Medical Association.

A. M. A. SCIENTIFIC EXHIBIT

Application blanks are now available for space in the Scientific Exhibit at the Cleveland Session of the American Medical Association, June 11 to 15, 1934. The Committee on Scientific Exhibit requires that all applicants fill out the regular application form and requests that this be done as early as convenient.

The final date for filing applications is February 26, 1934. Any persons desiring to receive an application blank should address a request to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago, Illinois.

RESEARCH WORK ON GOITER

The American Association for the Study of Goiter, for the fifth time, offers Three Hundred Dollars ($300.00) as a first award, and two honorable mentions for the best essays based upon original research work on any phase of goiter presented at their annual meeting in Cleveland, Ohio, June 7, 8, and 9, 1934. It is hoped this will stimulate valuable research work, especially in regard to the basic cause of goiter.

Competing manuscripts must be in English, and submitted to the Corresponding Secretary, J. R. Yung, M.D., 670 Cherry St., Terre Haute, Ind., U. S. A., not later than April 1, 1934. Manuscripts received after this date will be held for the next year or returned at the author's request.

The First Award of the Memphis, Tenn., 1933 meeting was given Anne B. Heyman, A.B., M.S., University of Michigan, Ann Arbor, Mich., "The Bacteriology of Goiter and The Production of Thyroid Hyperplasia in Rabbits on a Special Diet." Honorable mentions were awarded J. Lerman, M.D., and W. T. Salter, M.D., Huntington Memorial Hospital, Boston, Mass., "The Calorigenic Action of Thyroid and Some of its Active Constituents," Prof. Dr. Stefan Konsuloff, Sofia, Bulgaria, "Experimental Studies on Etiology of Goiter."

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

SUPREME COURT DECLARES HEALTH AUDIT SERVICE UNLAWFUL

John Granger *vs.* A. W. Adson, J. F. Du Bois, E. J. Engberg, E. T. Sanderson, C. L. Sherman, Ivar Sivertsen, and G. B. Weiser, individually and as members of the State Board of Medical Examiners.

On November 3, 1933, the Supreme Court of Minnesota, in a very strongly worded opinion by Justice Loring, held that a layman could not conduct a health audit service furnishing urinalyses and blood pressure tests through the medium of employing a licensed physician to do the actual work. The Supreme Court of Minnesota held:

1. The plaintiff, a layman, in conducting a "health audit" for a fee for which he furnished his subscribers with the results of urinalyses and blood pressure tests and either himself advised, or passed on to the subscriber advice from the pathologist who made the urinalyses, as to whether the results showed a normal or abnormal state of health and whether the subscriber should see a physician, in some cases advising as to

diet, exercise and habits, was practicing medicine unlawfully in violation of Sec. 5717 Mason's Minn. St., 1927.

2. In so doing he is practicing the science of healing in violation of Sec. 5705 Mason's Minn. St. 1927, which defines the science as including the diagnosis or analysis of the condition of human health.

3. Plaintiff's contract with his pathologist was illegal and in violation of statute and the public policy of the state.

In August, 1932, the plaintiff started an action in the District Court of Hennepin County, seeking an injunction to restrain the State Board of Medical Examiners from in any way interfering with the conduct of his business. His business consisted of periodical urinalyses and blood pressure tests. A licensed physician was in the employ of the plaintiff. A charge of ten dollars per year was made to the "subscriber." Judge Reed of the District Court sustained the demurrer interposed by the Medical Board and the order of Judge Reed was affirmed by the Supreme Court.

The Court among other things stated:

"Advising the subscriber for a fee as to certain improved habits of diet, exercise or living, although not accompanied by any medical prescription or treatment, is a violation of Sec. 5717." (Medical Practice Act)

The Court also held that the plaintiff was engaged in the diagnosis or analysis of the condition of human health and as such constituted a violation of the Basic Science Law. Sec. 5705 Mason's Minnesota Statutes 1927.

The Court summed up the entire matter by stating that the law intends:

"That the patient shall be the patient of the licensed physician, not of a corporation or layman. The obligations and duties of the physician demand no less. There is no place for a middleman."

This decision is of tremendous importance to the medical profession throughout the State of Minnesota and the United States. It will go a long way towards confining the practice of medicine to those who are licensed.

In addition to Justice Loring, who wrote the opinion, the following members of the Supreme Court concurred therein: Chief Justice John P. Devaney, Justice Andrew Holt, Justice Homer B. Dibell, Justice Royal A. Stone, Justice Clifford L. Hilton and Justice L. M. Olsen.

The State Board of Medical Examiners was represented by Harry H. Peterson, Attorney General, and F. Manley Brist, Special Assistant Attorney General. The State Board of Medical Examiners wish to acknowledge the splendid coöperation shown the Board in the defense of this case by Attorney General Peterson.

MINNESOTA SUPREME COURT UPHOLDS BASIC SCIENCE BOARD

Re Shenk *vs.* Minnesota State Board of Examiners in the Basic Sciences.

On October 6, 1933, the Supreme Court of Minnesota, after a reargument, upheld the Basic Science Board in its refusal to issue basic science certificates to naturopaths who were practicing in Minnesota in May, 1927, when the law went into effect.

William W. Shenk, who has held office in the naturopathic organization, and who claimed that he was lawfully practicing naturopathy in Minnesota in 1927, brought the action in the District Court of Hennepin County to compel the Basic Science Board to issue him a certificate without examination. Judge A. W. Selover sustained a demurrer interposed by the Basic Science Board, and thereafter an appeal was taken to the Supreme Court. On March 3, 1933, the Supreme Court affirmed the action of the District Court by a vote of five to two, Chief Justice Wilson and Justice Loring dissenting. Shenk petitioned the Court for a rehearing, which was granted, and the case was reargued on May 17, 1933. At the time of the last decision Chief Justice Devany, who succeeded Chief Justice Wilson, took no part in the decision of the case due to the fact that the present Chief Justice was not a member of the Court at the time the case was submitted.

In referring to Shenk, the Supreme Court stated:

"We now decide that he was practicing medicine and that such practice was unlawful. Hence he is not entitled to the benefit of the provisions of Section 8 concerning registration without examination."

The Court further stated that naturopathy as set out in the petition constitutes the practice of medicine. This decision will enable the various law enforcement agencies of the State of Minnesota to block effectively the unlawful practice of healing by those who are not duly registered or licensed.

COMMUNICATION

November 8, 1933

To the Editor:

May it not be timely to again call the attention of the profession in Minnesota to the occurrence of Amebiasis in this state, which is not as uncommon as is the general impression, by briefly mentioning our experience with this disease?

During the past twenty days, five cases of acute amebic dysentery were admitted to this hospital. In three of the cases, the finding of the endameba histolytica in the stools was a distinct surprise to the clinician. In two others, the experience with the first two was of help clinically and the examination of warm stools for amebæ was requested upon admission.

The first of the five is from Philadelphia, two are resident of Saint Paul and the last of Minneapolis. All of them, however, spent several days or more visiting at the World's Fair in Chicago, during the summer.

The practitioner may well keep in mind the possibility of amebic dysentery in cases of acute diarrhea with blood and mucus, and request at once the examination in such cases of the stools by a competent individual. If no reliable laboratory facilities are available, the advisability of the administration of emetine hydrochloride, for two or three days, should be considered, as a diagnostic measure, since the stools under this treatment, together with proper dietary régime, will become normal within a few days and temporarily, at least, free of the offending organisms.

Amebiasis is no longer to be considered a local disease. Its potentialities as a systemic disease are well illustrated by another patient who came under our observation a few months ago, complaining of chills and fever and vague pneumonic signs in the base of the right lung but without any history of intestinal disorders, at any time in his life, and in whom, at autopsy, the intestinal lesions were found to be minimum, in spite of amebic abscesses in the liver, brain and lungs and amebic infarcts in the lungs, spleen and the small intestine.

It is felt that many of the cases of the so-called intestinal "flu" and summer diarrhea, and the like, are being treated without the proper stool examination. A possibility of, at least, some of these cases being due to infection with the *endameba histolytica*, should be suspected and the search for the organism in stools be encouraged.

Since, also, the symptom-free cases of this infection or the "carriers" are an epidemiological problem of far reaching significance, it should be doubly important that the profession be again reminded of the ever present possibility of this disease, at this time.

KANO IKEDA, Pathologist,
The Chas. T. Miller Hospital, Saint Paul, Minnesota

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

Group Practice and the Medical School

THE effect of a general system of group practice upon medical education did not figure much in public discussions of the Majority Report of the Committee on the Costs of Medical Care at its release last fall.

More immediate and obvious considerations occupied critics and proponents at that time.

This very important aspect of the question was discussed at length, however, by Father A. M. Schwitalla, Dean of St. Louis University School of Medicine and himself a member of the Committee on the Costs of Medical Care, before the Minneapolis session of the meeting of the Association of American Medical Colleges, October 31. In a very scholarly and impressive paper Father Schwitalla outlined clearly the effect that the radical changes proposed must necessarily have on medical education.

With group practice as proposed by the Majority Report in operation, the general practitioner would disappear from the picture. With him would go the requirement for a broad foundation of medical knowledge now insisted upon by all first class medical schools as a basis both for general practice and the specialties.

The evils to be observed in specialism under our present system have drawn the anxious and disapproving attention of physicians and school men. Plans are under way in many county and state organizations for some machinery to curb and control it.

The picture drawn by Father Schwitalla of a future practice of medicine given over entirely to specialism and open to all the evils inherent in such a system is disquieting.

The wisest medical observers today earnestly advise not the expansion, but the limitation of specialties to those with qualifications that meet definite standards to be set by the profession itself. They regard this limitation and standardization of specialists as a great necessary reform comparable to the reform of medical education which is one of the glories of the American medical profession.

As an educator, Father Schwitalla sees an impossible situation confronting both the schools and the practicing physician born of the necessity for every medical man to become a specialist of some kind if he wants to survive. Such a "reform," he declares, will open the door to charlatanry and inferior practice.

"It was unfortunate," said Father Schwitalla, "that the Minority Report was of necessity so incomplete. With a very short time to prepare the report, its signers stated their general attitude definitely and forcefully. They were not able, however, to outline in detail the results they foresaw so well of any such wild recasting of medicine."

There is a wide gulf, Father Schwitalla remarked, between the medical viewpoint and the sociologist's viewpoint, the latter being evident in the report of the majority.

"We are sometimes told," he said, "that we must allow the sociologist to take the lead; that we must fall into step with him or fall into the rear guard. The enterprise and facility of the social worker is quite frequently held up in marked contrast to what is called medical complacence and smugness.

"It is true, no doubt, that there is a lag in medicine between the newest advances in knowledge and the general application in practice of these advances.

"Certainly there is no lag between new ideas and prompt practice among the sociologists. The sociologist is as quick as popular opinion to seize upon a new idea and to put it to the test. And he is likely to shift just as quickly.

"Medicine is asked to accept new conclusions with the same precipitateness as the social worker and is met with impatience if it exhibits a resistance born of innate realism and conservatism.

"Medicine cannot hold itself aloof from social conditions, of course. It has its own characteristic contribution to make. But it cannot hope to accomplish anything if its aims are identified with those of the social worker."

OBITUARY

Mrs. Louis B. Wilson

Relatively few mortals have the ability and industry to become leaders in their vocations. In the passing of Mrs. Louis B. Wilson, the occasion arises to record a career which was outstanding in the field of medical literature.

Annie Maud Headline was born near Faribault, Minnesota, and graduated as a nurse at the Presbyterian Hospital in Chicago. In 1889 she married Dr. Ernest J. Mellish. Following the death of Dr. Mellish in 1905, Mrs. Mellish took up medical library and editorial work at the Augustana Hospital in Chicago.

In 1907 Mrs. Mellish became associated with the Mayo Clinic and took charge of developing the Clinic library. Until recently she had charge of the publications of the Clinic. Fortunately, Mrs. Mellish has left us the results of her extensive experience in medical publications in the form of a book entitled "The Writing of Medical Papers," which has appeared in three editions. This small volume may be followed as a standard by the members of the medical profession and contains many valuable suggestions on the writing of medical papers.

In 1924 Mrs. Mellish married Dr. Louis B. Wilson of Rochester, Minnesota. In addition to her husband she is survived by two brothers, Charles and G. F. Headline of Faribault, and a sister, Mrs. Ida C. Denny of Basin, Wyoming. Her death occurred on November 6, 1933, following a prolonged illness.

Dr. David Graham

1859-1933

Dr. David Graham, aged seventy-four, pioneer of West Duluth and president of the Duluth Hospital in West Duluth, died Saturday afternoon at his home after a lingering illness. He was born in Florence, Ont., was graduated from the Detroit College of Medicine and settled in West Duluth forty years ago.

Dr. Graham was a member of the Minnesota state legislature in 1903 and 1909, was a member of the St. Louis County Medical Society, the Minnesota State Medical Association, the American Medical Association and was a past master of Euclid lodge, No. 198, A. F. & A. M. He was a member of the Scottish Rite and of Aad temple, Nobles of the Mystic Shrine.

Dr. Graham is survived by his wife; one son, Dr. Reginald D. Graham, West Duluth; one sister, Frances, Manitoba; three brothers, Joseph, Niagara Falls, N. Y., Dr. Robert Graham, Duluth, and Charles Saskatchewan; and four grandchildren.

Dr. Robert Stewart Bole

1860-1933

Dr. Robert Stewart Bole, since 1884 a practicing physician in Saint Paul and for the past thirty years associated with the Saint Paul City Railway Company, died Saturday, September 16, 1933, at Saint Luke's Hospital.

Dr. Bole was born at Ryegate, Vermont, March 24, 1860, the son of a Presbyterian minister. In 1862, his parents moved back to Scotland, their former home, and he spent his early childhood there and, later, in Belfast, Ireland. After seven years, they returned to the United States, and he attended public school in West Barnet, Vermont, and the Peacham Academy. When he was sixteen, he went to Boston and received training as an apothecary. He spent two years on the United States training ship for naval officers, Portsmouth, which made an extended voyage by sail and touched the Continental and Mediterranean ports. His medical education was completed at the University of Vermont.

He entered general practice in Saint Paul in 1884. Ten years later he married Katherine Fox, who died December 31, 1930. Dr. Bole was a member of the Ramsey County, Minnesota State and the American Medical Associations.

He is survived by a brother, James Bole, of Bozeman, Montana; two sisters, Mrs. Margaret Hamilton and Miss Marion Bole, of Waterbury, Connecticut, and four grandchildren, Robert Howard, Marianne, Patricia and Katherine Maas, all of Saint Paul, Minnesota.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCOST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of December will be as follows:

December 6—Tuberculin Testing.
December 13—Hand Infections.
December 20—Sanitary Achievements.
December 27—Heredity and Cancer.

STATE MEETING, 1934

Several program departures are in contemplation for the 81st annual meeting of the Minnesota State Medical Association to be held July 16, 17 and 18, in Duluth.

If present plans materialize morning sessions will be devoted exclusively to demonstrations, clinics and exhibits, the Committee on Scientific Assembly announced following its second meeting held Saturday evening, November 4, at the Lowry hotel in Saint Paul. Following these plans the papers will be read during afternoon sessions and all will relate in some manner to the demonstrations or exhibits given in the morning.

A tentative list of subjects both for demonstrations and papers has already been drawn up. When this list is complete the committee plans to send it to all members of the association for their criticism and suggestions.

The suggested list now includes toxicology (medico-legal, industrial an dhousehold); encephalitis (with special reference to the epidemic in St. Louis); pure food; the anemias; traumatic surgery; heart (with exhibit, clinic and possibly movies); coronary disease; gastritis with possible x-ray movie showing rugæ of the stomach; diabetes; cancer; artificial fever treatment; symposium on the endocrines (exhibit and papers); differential diagnosis of obstructive and interhepatic jaundice; tularemia; brucella abortus; diarrheas; amebic dysentery; newer concepts of nutrition and vitamins; agranulocytopenia as a result of use of barbiturates; arteriosclerosis of the nervous system; manifestations and treatment; squint; tumors of the nose and throat; carcinoma of the larynx; plastic surgery in facial paralysis; late results of thoracic surgery in pulmonary tuberculosis; gastro-intestinal surgery; physiology and pathology of the liver; fractures; bone lengthening in flat foot conditions; bone tumors; peripheral vascular disease; diag-

nosis of the unconscious patient; preventive inoculation and serum treatment of the acute infectious fevers; syphilis; trichinosis; pneumoconiosis or silicosis and actinomycosis.

A number of distinguished out-of-state speakers will be invited to speak and take part in demonstrations and clinics, the committee says. In addition there will be social events including the golf tournament, alumni and fraternity gatherings.

MINNESOTA RADIOLOGICAL SOCIETY

The Minnesota Radiological Society held its fall meeting at the St. Paul Athletic Club, St. Paul, Minnesota, November 11, 1933. The following program was presented:

1. Osteochondritis Juvenilis Deformans (Perthe's Disease). Report of cases.
   W. L. Burnap, M.D., Fergus Falls, Minnesota
2. Observations from a Clinical Tour
   M. A. Shillington, M.D., St. Paul, Minnesota
3. Pneumonia in Young Infants Associated with the Aspiration of Various Oils
   Kano Ikeda, M.D., St. Paul, Minnesota
4. The Roentgen Diagnosis of Placenta Previa
   Walter H. Ude, M.D., Minneapolis, Minnesota
5. The Improvement of Chest Radiography
   R. B. Wilsey, M.A., Rochester, New York
6. Motion Picture Demonstrating Manufacture of X-ray Film
   L. A. Carlson, St. Paul, Minnesota
7. The American Registry of Radiological Technicians
   George M. Landau, M.D., Chicago, Illinois

ADDRESS

The Value of Ventriculography and Encephalography to the Brain Surgeon
Alfred W. Adson, M.D., Rochester, Minnesota

SOUTHWESTERN MINNESOTA SOCIETY

The Southwestern Minnesota Medical Society held the annual meeting at the Thompson Hotel, Worthington, Minnesota, Tuesday, November 7, 1933, at 7:00 P. M.

At the business meeting of the Society the following officers were elected for the coming year: President, Dr. H. DeBoer, Edgerton; vice president, Dr. W. H. Halloran, Jackson; secretary-treasurer, Dr. E. G. McKeown, Pipestone.

Seven doctors were elected to membership in the Society: Dr. B. J. Bouquet, Adrian; Dr. D. J. Halpern, Brewster; Dr. Robert E. Priest, Worthington; Dr. E. M. Sorensen, Round Lake; Dr. Rudolph E. Johnson, Worthington; Dr. S. W. Watsen, Jeffers, and Dr. C. A. Williams, Pipestone, Minn.

The following program was presented:

"Adenomyomata and Endometriomata with Report of Cases"—Dr. W. J. Benjamin, Pipestone, Minn.

"Case Report"—Dr. H. C. Doms, Slayton, Minn.

"Tuberculin Testing Among School Children"—Dr. Wm. P. Ross, Worthington, Minn.

"Medical Economics"—Dr. C. L. Sherman, Luverne, Minn.

A social time was then held in honor of Dr. C. P. Dolan, Worthington, who has been in practice for fifty-seven years. Drs. C. L. Sherman and W. R. Brock, in honoring Dr. Dolan, gave very interesting talks, to which Dr. Dolan very pleasingly responded. Forty-one members and friends of the Society were present at this meeting.

The Society has held three special meetings this fall as follows:

October 9, 1933, Fulda, Minn.: Dr. A. B. Rivers, Rochester, Minn., "New Developments in the Medical Treatment of Ulcers"; Dr. H. K. Gray, Rochester, Minn., "Evaluation of Surgery in Gastric Carcinoma."

October 20, 1933, Fulda, Minn.: Dr. Owen H. Wangensteen, University of Minnesota, "The Recognition of Acute Abdominal Disorders with Comments on Therapy."

October 26, 1933, Heron Lake, Minn. Drs. Adison, New and Masson presented a very interesting program on "Abdominal Surgery and Gynecology." This was presented with lantern slides and moving pictures.

E. G. McKeown, *Secretary-Treasurer.*

WOMAN'S AUXILIARY

President—Mrs. A. A. Passer, Olivia
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. S. H. Baxter, Minneapolis

The second Board meeting of the year was held at the Commodore Hotel, St. Paul, October 20, at ten o'clock, with Mrs. A. A. Passer, state president of the Auxiliary, presiding. Forty members and four guests attended the meeting.

After the business of the day a luncheon was served, followed by interesting table talks by Dr. N. O. Pearce, president of the Minnesota State Medical Association, and Dr. E. A. Meyerding, secretary of the State Association.

Of interest to the group was the announcement and showing of prizes to be given in the State Radio Contest to be conducted by the State Auxiliary for students in the high schools of Minnesota, the subject to be: "Youth—the Hope of Tuberculosis Control." The first prize is a plaque appropriate to the subject to be placed in the school room of the pupil who wins it. Ten individual prizes will be awarded to those whose papers are deserving of merit.

Mrs. James Blake, president of the National Auxiliary, and Mrs. A. A. Passer, president of the State Auxiliary, attended the National Auxiliary meeting in Chicago, October 27.

HENNEPIN COUNTY

A social meeting was held October 6 at the home of Mrs. Carl Waldron. In the receiving line as honor guests were Mrs. James Blake, president of the National Auxiliary, Mrs. A. A. Passer, president of the Minnesota State Auxiliary, and Mrs. Martin Nordland, president-elect of the State Auxiliary. Many new members were welcomed and a delightful musical program was given by Mrs. Agnes Griswold Teasdale, accompanied by Mrs. Eleanor Freemantel.

Mrs. Frederick Erb, president of the Hennepin County Auxiliary, announced two projects to be undertaken.

(1) The first project is a radio contest similar to that to be carried on throughout the State Auxiliary. Participants in this contest are to be students in high schools of Hennepin County. The subject is to be the same as that chosen for the state contest: "Youth—the Hope of Tuberculosis Control." Mrs. C. B. Wright is chairman for the contest, which will end in November. The prizes for this contest are a choice of a two weeks' vacation in a scout or similar summer camp or a wrist watch for the boy and girl who send in the best essays on the subject.

(2) The second project to be undertaken is the sponsoring of a sale of articles made by the patients of the Occupational Therapy department of Glen Lake Sanatorium with Mrs. Stephen H. Baxter acting as chairman. The Dayton Company has generously loaned us space on the fourth floor, near the Tea Rooms, for three days—Wednesday, Thursday and Friday, November 21 to 24. The articles to be sold are all made by the patients, and the money received goes directly to

them. This is the only opportunity these people have of making money to buy many of the necessities and a few of the luxuries they need. The articles are beautifully made and very reasonable. They took fifty first prizes at the State Fair.

As a group, the Auxiliary on November 17 helped with the preparation and mailing of the Tuberculosis Christmas seals.

Hennepin County is having an exceptional year in the matter of interest and attendance at meetings. On November 3 our regular business meeting was held in the parlors of the Hennepin County Medical Society. After the meeting Mrs. Blanche Jones talked of her work as policewoman in Minneapolis, and a most beautiful musical program was given by Mrs. Ann O'Malley Gallogly.

Our annual Christmas party is planned for December 1 at the home of Mrs. G. T. Nordin, with Mrs. W. E. Patterson in charge of the program.

WEST CENTRAL

A regular meeting of the Auxiliary to the West Central Medical Society was held at Morris, October 11, jointly with the medical group.

Mrs. E. T. Fitzgerald of Morris presided at the business session following the banquet. New officers elected are: President, Mrs. E. A. Eberlin, Glenwood; secretary-treasurer, Mrs. A. F. Geisen, Starbuck.

WRIGHT COUNTY

The annual meeting of the Wright County Medical Society and Auxiliary was held on Tuesday, October 24, at the home of Dr. and Mrs. J. J. Catlin, Buffalo. Twenty-three members were present.

Dr. Moses Barron gave a lecture on "Anemias," illustrated by slides. Officers of the Auxiliary include: Mrs. Leslie Bendix, Annandale, president; Mrs. L. Harriman, vice president; Mrs. J. J. Catlin, Buffalo, secretary-treasurer.

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

STATED MEETING HELD OCTOBER 5, 1933

The President, DR. KENNETH BULKLEY, in the Chair

THE TREATMENT OF BRANCHIAL FISTULÆ WITH SCLEROSING FLUIDS

A CASE PRESENTATION AND REPORT

E. C. ROBITSHEK, M.D., F.A.C.S.

An apology is offered, for the remarks made herewith, because of their elementary nature and because much is quoted verbatim from the literature. I am hopeful, however, that your interest in the now simple and successful treatment of these cases, as against the previous tedious, difficult, and not always successful surgical operative method, may be sufficiently aroused to repay you for your kind indulgence.

According to Kaufmann, in early embryonal life, four pouches are developed between the gill clefts in the lateral pharyngeal walls. These pouches, but more especially the clefts, become or participate in the formation (in the first) of the Eustachian tube, the middle ear, external auditory canal and the pinna. The second pouch forms the receptacle for the pharyngeal tonsil. From the third pouch, the thymus is developed, and the fourth corresponds to the priform sinus in the anlage of the lateral lobes of the thyroid. Part of these tracts may remain open, but more especially those connected with the third gill.

Fistulous channels remain with an external or internal opening—called blind, incomplete, external or internal, or complete with both openings. They are called congenital cervical fistulæ, gill or cervical gill fistulæ, gill cleft fistulæ or simple branchiogenic fistulæ.

The external orifices of these fistulæ are usually indicated by a nodule of skin and are situated, according to Sutton, in the line of the anterior border of the sternomastoid muscle opposite the angle of the jaw, the thyrohyoid space and sternoclavicular articulation. The internal orifices are either in the region of the tonsil or the sinus piriformis.

The history often reveals whether the sinus dates from birth. However, it frequently happens that a branchial cleft cyst persists in the deeper part for years after birth and then gradually works its way to the surface, finally penetrating the skin and forming a sinus. Actinomycosis sinuses are situated in a hard board-like tissue, are usually multiple, and do not extend very deeply. Tuberculous sinuses arise from glands or tuberculous foci in the bone, generally in the vertebral column. Such sinuses are usually located in the posterior portion of the neck, while congenital ones usually appear in the middle of the neck or in the region of the sternomastoid muscle.

The secretion from a sinus affords additional diagnostic aid. Assuming that diagnosis of a congenital sinus is established, it still must be determined whether the case is one of branchial cleft sinus or whether it is a so-called median sinus arising from the thyroglossal duct. If it opens in the midline and it runs along the course of the middle lines toward the hyoid bone, its origin in the thyro-glossal duct is quite certain. If it opens on the side it is usually a branchial cleft sinus. To determine if a sinus is complete, and, if so, the location of the internal opening, one should inject some colored solution, such as methylene blue, into the external orifice. In case of thyroglossal duct sinuses, the fluid will appear at the foramen cecum in front of the epiglottis. In case of a branchial cleft sinus the solution will appear at the lateral pharyngeal wall. Sodium iodide or lipiodol should be injected into the sinus and its course followed in a skiagram. However, I find a bismuth emulsion, such as Beck's paste, injected for this purpose of more value in assisting in outlining the course of such a tract. These fistulæ are lined with a secreting epithelium which must be removed or destroyed, or recurrence will take place. Removal by surgical operation consists in an exact anatomic dissection of some difficulty, owing to the adherence of the wall of the tract to the sheath of the great vessels and the difficulty of following the tract to its ultimate termination in the wall of the pharynx.

Treatment of these tracts and fistulæ with sclerosing solutions was undertaken as far back as 1829 with little or no success. My attention was drawn to this subject in an article entitled "The Use of Sclerosing Solutions in the Treatment of Cysts and Fistulæ," by Drs. E. C. Cutler and R. Zollinger, as published in the *American Journal of Surgery*, Vol. 19, No. 3, March, 1933. They reported several cases of cervical fistulæ and pilonidal cysts treated and cured by the injection

of a modified Carnoy's solution. This solution consists of absolute alcohol 6 c.c., chloroform 3 c.c., glacial acetic acid 1 c.c., ferric chloride 1 gram. This solution has the qualities of moderate penetration with rapid fixation of the lining cells and excellent hemostasis. Furthermore, therapy may be carried on with the patient ambulatory and radical surgical operation avoided.

The patient I wish to present tonight is a white man, aged twenty-seven, by occupation a bookkeeper. With

Fig. 1. Antero-posterior view showing extent of congenital sinus of the neck injected with Beck's paste. The sinus was obliterated successfully by injection of sclerosing fluid.

the exception of quinsy, more especially on the left side, in 1922, and tonsillectomy performed at a later date, his history of previous illnesses is entirely negative. His complaint consisted of a discharge from a small opening in the skin of the lower portion in the left side of his neck. This has persisted as far back as he can remember. Sometimes the discharge would cease for two or three days, during which time the throat became irritable, a cough developed, all being relieved by a reappearance of the discharge through the external opening. Complete physical examination was entirely negative. The patient appeared at my office first on July 25 and was referred to me for treatment for his cervical fistula. I decided to use the sclerosing fluid as previously mentioned. I first injected methylene blue to determine if the fistula was a complete one and to locate the internal opening. With the assistance of an injection of methylene blue I was able to see the internal opening located in the left pharyngeal wall near the base of the tongue. I then injected lipiodol and took an x-ray film at the same time. This was not entirely satisfactory.

The following day I injected a bismuth emulsion and repeated the x-ray study which showed the tract more clearly throughout its entire extent. A day or two later I injected this sinus with the sclerosing fluid, using an ordinary 2 c.c. hypodermic syringe, but first covering the site for injection and the area about the external opening with vaseline to prevent irritation or burns of the skin. While the patient's mouth was open I held a pad of cotton over the area of the internal opening and then waited a minute for the solution to penetrate, to some extent at least, the lining of the sinus. The only reaction the patient suffered was an irritated raw feeling of his throat which he stated reminded him of the time he had his tonsils removed.

Although over two months have elapsed since this treament, the sinus has remained closed for the first time in twenty-seven years.

DISCUSSION

DR. J. F. CORBETT: I think this paper is very much worth while. It is something that as far as I know has not been done as often as the procedure apparently merits.

While not a branchial cyst, there is a case which comes to my mind and which, if you will bear with me, I will report. This patient had been shot in the face and there was a fistula of the parotid gland, the normal duct being practically closed. A very fine probe could be passed into the distal portion of the duct but it accomplished nothing definite in reëstablishing the continuity and finally Dr. Sedgely at the Veterans' Bureau injected some absolute alcohol. He did that with a good deal of pressure, so much so that he could feel the parotid gland swelling at the time. This was followed by a terrific reaction, a great deal of pain and discomfort, which finally subsided and in the course of time I examined the patient to see whether or not there was any secretion from the ampulla. This could not be found.

I asked the patient if that side of his mouth was dry and he said it was. Apparently the alcohol injection had destroyed the parotid gland. He was given just one injection under quite a bit of pressure but it seems that if it would destroy the epithelial lining of the parotid it would sclerose the smooth wall of a cyst. I congratulate Dr. Robitshek in his reported case. I would like to ask him how much swelling and discomfort there was following this injection?

DR. GILBERT COTTAM: I have had a recent opportunity to use this solution in a young man with a pilonidal sinus which persisted after four attempts at operative relief by dissection had been made during the last six years. I found an area of scar tissue about two inches wide by four inches long over the lower lumbar vertebræ, at the lower end of which was a fistulous opening discharging sanious fluid. About one and a half inches below this opening was another one, between the folds of the nates, which apparently was not discharging any fluid. Communication between these two openings was, however, demonstrated by injection of lipiodol followed by the taking of lateral x-ray pictures which also showed that the sinus was wholly superficial. Two injections of the sclerosing solution were made, five days apart, and at the last examination, made six months ago, the lesion appeared smoothly healed.

It is a simple procedure, free from unpleasant drawbacks, and would seem to have its greatest field of usefulness in these congenital sinuses which are difficult to eradicate by dissection. It can also be used in any type of sinus formation where the fluid can be confined to the sinus itself, but I question the advisability of its employment in such conditions as the bronchial fistulæ which sometimes remain after thoracotomy, for in such cases there would be no way of preventing the fluid from reaching the interior of the lung.

DR. O. W. YOERG: I would like to ask Dr. Robitshek whether or not this could be used with a urachal sinus. At times these lesions have a rather large sac.

DR. E. C. ROBITSHEK: The authors of the original article do not mention this mode of treatment for such purposes, and I have had no experience with such cases.

Dr. Corbett asked about swelling—there was no swelling present following this treatment in my patient. However, he stated that he felt a sharp cutting pain

following the treatment which reminded him of a similar pain following the removal of his tonsils.

DIAPHRAGMATIC HERNIA

CASE PRESENTATION

O. W. Yoerg, M.D.

The case is that of an elderly woman, seventy-three years of age, the mother of twelve children, with a negative history except for pneumonia when forty years old and a history of injured ribs and shoulder at different times. Whether or not there had been actual fractures I was not able to ascertain.

She gave a history of having been perfectly well, as far as her abdomen was concerned, until about two months ago, while turning over in bed, she experienced severe pain in the lower part of the left chest. After getting up and walking around, the pain gradually disappeared. She has had a number of attacks since then and has noticed that heavy meals cause her distress.

The examination of the abdomen did not show anything definite except apparently some tenderness in the upper abdomen. There was no history of an ulcer or gall-bladder attack. The patient stated that the pains penetrated to her back over both shoulder blades and occasionally to the top of her shoulders. Dr. Allison made a gastrointestinal study and found a hernia at the esophageal hiatus. A part of the stomach has herniated into the chest cavity on the left side. Dr. Hanson, Dr. Allison's associate, stated that the opening is one of the largest they had ever seen. The esophagus is apparently pushed up and curled.

Dr. Hanson said that when he made a fluoroscopic examination in the erect position the stomach had entirely dropped out of the hernial sac of the chest and lay in its normal position in the abdomen.

About ten days or two weeks ago the patient had abdominal distress and has been in the hospital for two days. She is definitely jaundiced. A flat plate of her gallbladder is negative. The question is, does she also have gallbladder and liver disturbance? An abdominal binder was applied which has given her some relief. She likes to wear it in bed, as ordinarily, in turning, she experiences considerable pain due, undoubtedly, to a pull on the stomach attachments.

Dr. Bulkley called my attention to a recent article in *The Journal of the American Medical Association* (Vol. 101, No. 13, Sept. 23, 1933) on Diaphragmatic Hernia. It appears that prior to 1925 the condition was only occasionally recognized and according to the Rochester statistics, I believe, only thirty cases were recognized prior to 1925 and 147 cases from that time until 1933. It appears that most of the x-rays had been taken with patients in the erect position with the stomach out of the hernial sac. Now all pictures are taken with the patients lying down and the condition is easily recognizable.

Harrington states that he examined the esophageal region in several hundred abdominal operations and has found many cases where he has been able to put from one to three fingers along the esophagus into an apparently small hernial sac.

Fig. 1. X-ray taken with the patient in erect position showing upper portion of stomach above diaphragm. The esophagus is curled and pushed upward to the left.

Fig. 2. X-ray taken with the patient in a recumbent position. The outline of the barium is visible and the esophagus is apparently pushed to the right.

DISCUSSION

Dr. E. C. Robitshek: Diaphragmatic hernias occasionally follow severe crushing types of injuries. This fact should be kept in mind when examination of such injured patients are undertaken. The symptoms of diaphragmatic hernia are frequently indefinite, but most commonly resemble those of diseases of the gallbladder or gastrointestinal tract.

Dr. O. W. Yoerg: I did not go into the etiology of this condition, thinking that probably you would get more out of Dr. Harrington's article.

Apparently all para-esophageal hernias are congenital in origin although we do have traumatic hernias. Hernias due to trauma are not really true hernias and can be through the dome or various parts of the diaphragm. The congenital type all have sacs, and apparently the sac is most frequently attached to the stomach.

In operating, the ligament of the liver is cut in order to pull the liver down for better exposure. It is often a difficult procedure. The condition becomes operable only if the patient suffers distress.

Dr. J. F. Corbett: The chest approach will simplify it.

Dr. O. W. Yoerg: The chest approach is often used

although the abdominal route is preferred by most surgeons.

DR. E. C. ROBITSHEK: Might we have strangulation in cases of this type?

DR. O. W. YOERG: I believe not in this type, perhaps in the traumatic type.

MALIGNANT TUMORS OF THE LARGE INTESTINE

PATHOLOGIC ASPECTS OF 210 CASES COMING TO NECROPSY

LAWRENCE M. LARSON, M.D., PH.D.
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Minneapolis

The findings upon which this report is based are taken from a series of 210 cases of malignant growths of the colon which came to necropsy in the Department of Pathology of the University of Minnesota up to July 1, 1933. This disease is not infrequent as judged from many statistical reports, its incidence being almost equal to that of cancer of the stomach. Up to July 1, 1933, of 21,648 autopsies done by the Department of Pathology, 723 deaths resulted from malignancy of the intestinal tract proper. This study excluded carcinoid tumors of the appendix, and neoplasms of the gallbladder and pancreas. The distribution of these 723 cases is as follows: oral cavity, 42; esophagus, 57; stomach, 399; small bowel, 11; large bowel and anus, 214. The highest age incidence occurred in the fifth and sixth decades; the youngest patient was fourteen years and the oldest eighty-four; there was no marked preponderance of cases in either sex.

The anatomic distribution of these 210 cases was as follows: Cecum, 26; ascending colon, 5; hepatic flexure, 10; transverse colon, 8; splenic flexure, 7; descending colon, 11; sigmoid, 36; rectosigmoid, 33; rectum, 73; anus, 1. It is thus seen that these growths were located with the greatest frequency at the two extremities of the colon and again emphasizes the fact that regions of stasis in the bowel are of especial predisposition in the etiology of neoplasms. An encouraging fact is that more than one half of these tumors of the colon were located in the rectum, rectosigmoid or lower sigmoid, and theoretically at least these could be visualized by direct inspection through the sigmoidoscope or proctoscope.

In about one half of the cases coming to necropsy the malignant lesion was mechanically resectable by surgical methods, since no extension or metastasis was found at autopsy. About a third of the cases presented metastases in the liver or regional glands. At the flexures of the colon, the hepatic, splenic and the rectosigmoid, where considerable narrowing of the lumen takes place, metastases to distant organs were much less frequent than at other areas. This is due to the fact that in these situations the neoplasm very soon causes obstruction and relief is sought or death occurs at a relatively earlier date than with lesions in other locations. In other regions, namely the cecum, ascending, transverse, and descending colon, the sigmoid and the rectum, there were no differences as to the incidence and location of their metastases. Practically every organ in the body was involved in metastases in this series of cases.

The seriousness of obstruction anywhere in the large intestine is well known because of its distressing symptoms, its frequently disastrous termination, and the type of lesion which it usually denotes. In this series, 81 per cent showed obstruction which in many instances was complete, and in practically all cases contributed to the fatal outcome. Spontaneous perforation of the growth occurred in 30 per cent of the cases. This is a relatively few number when one considers the fact that high degrees of obstruction accompanied this ulceration, and again emphasizes the tendency of these lesions to slow growth. The ever present chronic inflammatory reaction with its consequent fibrosis and scar formation renders these areas able to withstand high degrees of intraintestinal pressure. Conversely, the more rapidly a tumor grows, the more likely it is to perforate, and when it does there is widespread extension of the malignancy if the individual does not succumb to the immediate effects of the perforation.

The immediate cause of death in these cases was most frequently peritonitis; secondly, exhaustion from the deleterious toxic effect of the tumor and its metastasis; and, lastly, associated diseases such as cardiorenal-vascular, pulmonary, cholecystitic, appendicitis or primary malignancy located elsewhere in the body.

Polyposis was present in localized areas in twelve cases and was diffuse throughout the colon from the cecum to the anus in four instances. The relationship of these polyps to carcinoma has been proved and there seems to be convincing evidence that if the patient harboring these tumors lives long enough, malignant metamorphosis will eventually take place.

DISCUSSION

DR. J. F. CORBETT: I was rather surprised in the figures, if I understood them correctly, of the common incidence of metastases in all locations of growths of the large bowel. There is a common impression that tumors on the left portion of the bowel, the sigmoid and the descending colon, are more apt to be followed by metastases than in the tumors of the cecum. Perhaps the reason the anatomical results differ from the surgical results is this: Usually in the right half of the abdomen we have a clean-cut blood supply and it is possible to do a very complete and radical operation. Tumors on the other side, particularly those lesions located at the junction of the sigmoid and descending colon, bring up the question of a very complicated blood supply and an adequate circulation must be maintained at any cost. The removal of a considerable portion of the mesentery is apt to destroy the blood supply to the distal portion of the bowel and I think most surgeons are apprehensive of this and perhaps cut the corners a little more closely than they do when they are dealing with a distinct blood supply, as we have on the right half of the body.

It seems to me that most of the patients I have seen have come, perhaps, not because of the absolute obstruction but of impending obstruction. Symptoms of difficulty in evacuating the bowels, pain referred to the colon, bring patients to the doctor and I must confess that it was largely through the medium of the x-ray that I have been able to make a diagnosis in a majority of these cases. I think that this applies particularly to carcinomata of the left half of the colon as they are not readily felt and are really recognized because of the obstructive tendency.

I recall a case a short time ago where there was extremely early metastases in a case of carcinoma of the right colon. The tumor was in the ascending colon, had not produced any obstructive symptoms. The patient was anemic, and fortunately in this case I had an x-ray taken before attempting any surgical removal and found very large metastases in the lungs. The tumor had not obstructed. It was a question whether the lung metastases would destroy the patient before any emergency surgery became necessary. It did destroy the patient before obstruction occurred.

This subject is so great that I hardly know where to begin on such short notice, and where to end the discussion. I want to thank Dr. Larson for his painstaking efforts in reviewing the statistics and I think he has given much encouragement to the surgeon in early operation and even in operation where the symptoms of obstruction have developed.

DR. C. O. RICE: I would like to have Dr. Larson discuss the treatment in relation to the grading of carcinoma. Is a carcinoma of the rectum, Grade 4, routinely left out of operation, and preferably given radium or x-ray? Also, regarding metastasis, does a Grade 4 carcinoma metastasize more quickly than a Grade 1 or 2?

DR. IVAR SIVERTSEN: I would like to ask Dr. Larson relative to the incidence of types of carcinoma in the so-called different areas in the bowel. There must be a difference as regards metastases, if we distinguish between the different types of growths. The *cauliflower* type of growth was formerly thought to be the most malignant. We now know it to be the least malignant. The *ring*, or *annular* form, is between the so-called least malignant and the most highly malignant, or the *colloid* type. Is there any difference as to incidence of these types in the different parts of the bowel?

The question of symptoms of cancer of the bowel is very important. Only last week I saw a case of cancer of the bowel where the patient complained of very indefinite abdominal pain, the chief symptom being that of diarrhea. There was no obstruction and no blood present in his stool. At operation we found a very large growth at the splenic flexure which had not been palpable previous to operation. This man laid all his symptoms to the fact that he had been drinking beer and believed his diarrhea was due to this. In this case there never had been constipation but he did have a definite soreness of the abdomen, plus a diarrhea. Any change in the bowel habits of an individual should demand a very careful and thorough examination of the colon.

DR. STANLEY R. MAXEINER: I regret very much that I did not arrive in time to hear all of Dr. Larson's paper. I think that this is a particularly timely subject and that the Doctor should be congratulated upon the excellence of his presentation.

It seems to me that one of the patient's symptoms which is deserving of particular note is a change from his normal stool habit. Someone mentioned the difference in the general appearance of the patient in right sided and left sided colon involvement. During the past few years, I believe we have had about thirty-six cases of carcinomas of the colon and rectosigmoid, and we have noted to a striking degree the presence of anemia and toxicity which accompanied the right tumors as compared with those situated on the left side.

With reference to technic of operation we have personally preferred to operated upon malignancies of the colon in more than one stage and in the presence of obstruction and distension our primary object has been to relieve the obstruction and later to remove the growth. Crile's efforts, I believe, have done more to establish the lowered mortality of stage operations than those of anyone else. Years ago I had the pleasure of watching Alexis Thompson of Scotland perform one of his superb operations for carcinoma of the rectosigmoid, and it will be borne in mind that he was one of the early advocates of radical surgery with the sacrifice of the sphincter. Thompson showed conclusively in his early statistics that his end-results were radically improved by this method.

We have a goodly number of patients with colostomies, some being women who have attended parties and played afternoon bridge without any one of their friends knowing that they had such a condition. A controlled colostomy with proper care is not the horrible thing that it formerly was and should never delay the patient or the surgeon in performing a prompt radical operation. We have one woman upon whom we operated by the Coffey technic following a colostomy for almost total obstruction of the rectosigmoid. Microscopic examination showed the pathology to be entirely inflammatory, superimposed upon a chronic diverticulitis. Restoration of the normal canal in this patient would have been an operative impossibility because of the location of the obstruction. The patient never had the last inch and a half of the rectum removed.

I have been very much impressed with the favorable results and the low mortality in our colon surgery, particularly the region of the rectosigmoid. We have several patients whom we operated upon and found what we considered practically hopeless and helpless conditions, but on whom we performed the radical operation and whom we find living and quite well five to seven years following their operations. In other words, it would seem that one is justified in taking somewhat desperate chances in a condition that carries virtually a one hundred per cent mortality. In one or two instances, we have had more difficulty in overcoming the objections of the patient's family physician than the patient's.

DR. LAWRENCE LARSON: The question concerning the gross appearance of the lesion in relation to its degree of malignancy is a rather difficult one. At the present time, as far as I know, there is not much evidence that the two are related except in the case of the colloid type, which is usually considered more malignant. Upon the microscopic picture alone can one differentiate relative degrees of malignancy.

The younger the patient who harbors the malignancy, the more likely the lesion is to be of a high degree of malignancy. The older the patient, the greater the chances are of the tumor being slow growing and the less the tendency to metastasis.

As to the symptoms of lesions of the right as contrasted to those of the left half of the colon, they are altogether different. On the right half, the contents of the colon are fluid, and the growths which occur here are most likely to be flat and ulcerating. They are not the annular napkin-ring type such as those of the left colon. On the left side the content of the colon is semisolid and solid, and, along with the constricting type of growth which is most common here, obstruction takes place early and may be the predominant symptom.

Authors have frequently divided the symptoms of carcinoma of the left side of the colon into three stages:

1. The chronic dyspeptic type of complaint, soon followed by
2. The chronic intermittent obstruction, and finally
3. The acute obstruction superimposed on the chronic.

The latter is disastrous and frequently terminates fatally.

Diarrhea as a symptom is usually due to an impaction of feces proximal to the growth, and when this is relieved intermittently, looseness of stools results. Previous to the diarrhea there is apt to be constipation. If the colon could be completely emptied the patient would be rid of the diarrhea.

X-rays are of little or no avail in the diagnosis of any lesion below the lower third of the sigmoid, but since this region is readily accessible to the proctoscope and sigmoidoscope, direct inspection can be readily carried out.

Anemia in lesions of the right colon is a distressing and common symptom and is very likely due to a tendency of this portion of the colon to absorb the toxic products which are elaborated by the growth.

As to the prognosis in relation to the degree of malignancy, it has been found that with adequate treatment, a Grade 4 malignancy has only one-fourth the chance that a Grade 1 has to be permanently cured, other things being equal. The more malignant the tumor, the greater its sensitivity to radium and the better the chance of curing it by that method. It is possible to radiate these tumors preoperatively and then resect the growth a month or two later. In a few instances there have been cases in which there was ab-

solutely no sign of the tumor when the time came for the operation, but of course, the rectum should be resected anyway. Whether or not that form of treatment will work out eventually in a satisfactory manner is difficult to say.

DR. STANLEY R. MAXEINER: I would like to ask if there were any sarcomas in these?

DR. L. LARSON: Not one.

DR. STANLEY R. MAXEINER: In our series we encountered one patient with lymphosarcoma of the rectum who is entirely well two years following a wide local excision. It seems that there are only about 100 cases of sarcoma of the rectum reported in the literature and these have usually died from the disease in due course whether they have been operated upon or not. Our patient had a thorough follow-up treatment with radium and to date has no evidence of recurrence. The sarcomas usually appear as submucous masses, rather rounded in character without ulceration of the mucosa, as compared with carcinoma, which early undergoes ulcerative degeneration.

DR. L. LARSON: I reported four cases of myosarcoma of the rectum with Dr. Rankin not long ago and in these cases death had taken place within two or three years from recurrences, except in one instance in which the patient lived four years, but he had a wide excision and apparently had been cured. The diagnostic feature about myosarcoma is that it arises beneath the mucosa, usually from the muscular tissues, and ulceration is a late phenomena, while obstruction takes place early, because of the broad indurated base which the lesion forms. Metastases are rather late as compared to carcinoma but the tendency to local recurrence is much greater so that radical extirpation is imperative.

F. A. OLSON, M.D., *Secretary.*

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of October 11, 1933

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 11, 1933. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. C. D. Freeman.

There were fifty members and one guest present.

Minutes of the May meeting were read and approved.

The scientific program was as follows:

DR. S. E. SWEITZER (Minneapolis) presented the patient and reported the following case of

LOCALIZED MYXEDEMA

Mr. C., aged sixty-two (patient of Dr. R. M. Pederson), developed a goiter in 1916 and was operated by Dr. Gilmore of Bemidji in 1917. A return of the goiter necessitated a second operation in 1926 and this was done at Rochester.

About 1931 the patient noticed swelling of both lower legs. This slowly disappeared but left a localized swelling which still persists. Many nodules and flat hard plaques are to be found on both lower legs. Biopsy showed myxedema. Basal metabolism at present is plus 65. Blood shows hemoglobin 70 per cent, white count 7,600. The eyes show slight exophthalmos. Other findings are normal.

This condition was written up by O'Leary, in 1930, and by Stokes and Pillsbury, in 1931. Recently Ingram reported a similar case. Including his own case, he was able to find only 26 cases reported in the literature. The analyses of Pillsbury and Stokes showed that these cases fall into two groups: (1) those characterized by nodular infiltrations variously distributed to the face, arms, back and scrotum, and (2) those in which are found plaques limited to the pretibial areas and in which the development of manifestations in the skin is associated with exophthalmic goiter.

DISCUSSION

DR. ARNOLD SCHWYZER (St. Paul): I think this is a very unusual case, in that the man has a plus 65 metabolic rate and a pulse of only 94, and no tremor. It does not look like a very toxic case. I believe it would be a good idea to have that basal metabolic test made over and see if it is really that high. If the rate is plus 65 it certainly is a very rare case. It makes one feel that there must be some other function in the thyroid than just the production of thyroxin, for here there is such a high metabolic rate, and there is also a myxedema which is usually cured very quickly with doses of thyroid. It is strange that he could have so much myxedema left. Is it not possible that there might be some other condition that would make a local change like myxedema, but not directly dependent on the thyroid? I think it worth while to take another basal metabolic test.

DR. F. R. WRIGHT (Minneapolis): The fact that this man was operated, his thyroid removed, and then developed his myxedema would lead to the suspicion that there may be some other condition, unknown, which causes myxedema.

DR. SWEITZER: An interesting fact about this patient is that at Rochester they had seven of these cases. Dr. O'Leary wrote an article on the subject. In the cases he described, the patients had as high as plus 50 metabolic rate after operation. In this case we tried Lugol's solution, 4 minims a day, but it pushed the heart rate way up and we had to stop it. I went over the literature quite thoroughly. Stokes and Pillsbury had collected 22 cases from the literature and had three of their own. Some of the cases did well under thyroid and some did not; some were left alone, nothing was done for them, and after a while the myxedema disappeared by itself. They thought possibly there was some interrelation between the thyroid and other glands that produced this myxedematous condition in the skin. So far as I could find out, they do not really know very much about it.

One would think this man should have a low basal, but he has a high basal metabolic rate. Two biopsies have been made and in one of them the section was almost pure slime; there was no bleeding, just a little oozing.

The reason I brought him here tonight is that, when I showed him at a recent meeting of the Minnesota Dermatological Society, a doctor from Superior saw the patient and said he had at that time a patient almost exactly like this man. I wondered if we were not missing some of these patients. This condition might not be so rare as we think. Sometimes when we find a condition we think rare, and report it, we hear of other cases just about like it.

DR. BERTRAM S. ADAMS (Hibbing) read his inaugural thesis entitled Gallbladder Disease. (To appear later in MINNESOTA MEDICINE.)

GALLBLADDER DISEASE

DISCUSSION

DR. MAX HOFFMAN (St. Paul): My thesis before this Academy was also on gallbladder disease. At that time I reported some 155 cases operated upon because of a history of gallbladder symptoms. In this group over 90 per cent showed definite pathological changes. Dr. Adams' group also showed pathology in a large percentage of the cases. He, too, emphasizes the importance of the history in making the diagnosis. Physical findings rank second.

In this connection I would like to mention a physical sign indicating gallbladder pathology that has recently come to my attention. In the presence of gallbladder disease, on inspiration there is definite tenderness below the costal margin on a light tapping with the ends of the fingers. On expiration, this tenderness disappears. Peptic ulcer cases do not present this sign. It differs from the usual method of examining for gallbladder trouble inasmuch as the percussion is light and the tenderness is elicited only during inspiration.

DR. R. T. LAVAKE (Minneapolis): I would like to hear some discussion as to the present opinion on the relative merits of cholecystectomy and cholecystotomy.

DR. ARNOLD SCHWYZER (St. Paul): As to drainage of the gallbladder, I may be inclined a bit too much toward one side. In about the last 400 cases I have not drained except perhaps in a very exceptional case. I remember one case where a surgeon did not feel that he should take out the gallbladder, but simply removed three stones that were about the size of the yolk of an egg. He did that in August. The woman later had trouble, and in the next February he brought the patient to me because of continued pain and fistula. When I went in, there were four stones just about the size she had had before. They could not have been overlooked. That shows again the well known fact that large stones can reform inside of six or seven months after simple emptying and draining of the gallbladder.

Conditions where I feel that drainage may be advisable do occur rarely; for instance, in a very bad condition of the heart, let us say in the presence of a gangrenous gallbladder; and still I must admit that in recent years I have taken out every one of these too. And they seem to have done better than I dared hope for. One such patient, however, had an embolism. Would it have been avoided by simple drainage? It is very questionable. There was a severe coli infection.

About a week or ten days ago I looked up my cases of embolism in a book in which I list my operations. There are the last 3,200 cases in that book, and in that group there were three embolism cases followed by death. The one bugbear we have in gallbladder operation is that the patient may have an embolus afterwards; but, even in the very acute cases, I feel like taking the gallbladder out. In these cases it is good if we can get along with a small incision. Of late I have made a new kind of incision. First an ordinary longitudinal incision is made; then, after dividing the outer rectus sheath, I pull the rectus out and split the transverse fascia horizontally. In that way, in closing the wound, the rectus muscle falls over the transverse sutures. I have done that in twenty-two cases. We were able to let the patients get up sooner, some getting up the day after operation, and the average being four days.

JOHN CHAPLIN BARTON, M.B., winner of the prize for the best piece of original investigation by an undergraduate of the University Medical School, read his essay on The Distribution of Intranuclear Inclusion Bodies Primarily Involving Vascular Endothelium, and was awarded the annual prize of $100.

THE DISTRIBUTION OF INTRANUCLEAR INCLUSION BODIES PRIMARILY INVOLVING VASCULAR ENDOTHELIUM

ABSTRACT

I am condensing my paper in order to cover in the shortest possible time the most essential features of it.

First, I should like to say something about the present concept of virus diseases. It is a well-established fact now that in virus diseases the virus grows intracellularly and produces changes in the cell recognizable as inclusion bodies. These inclusion bodies may be either cytoplasmic or intranuclear. Recent information indicates that cytoplasmic inclusion bodies, while they contain the virus, represent largely cellular material, inasmuch as incineration shows the inorganic material to be concentrated. Intranuclear inclusions do not show this inorganic concentration. Both types of inclusion bodies are quite resistant to trypsin digestion, showing at least a certain proportion of living substance to be present. Furthermore, the infective nature of the virus is not destroyed by this digestion.

We are primarily concerned here with intranuclear inclusion bodies; and these, like other inclusions, are acidophilic and are recognized in section by their staining red with eosin-hematoxylin or Giemsa stains, whereas nuclear material generally stains blue.

Now, something about the particular disease used for his study—fox encephalitis. Fox encephalitis was first described by R. G. Green, in 1926, and has been extensively studied since. This disease occurs on many fur farms in endemic and epidemic form and is undoubtedly imported from the wild. The incubation period is from four to five days. The onset is sudden, the animals sleep much and convulsions and paralysis are commonly found. The course is acute or chronic and the disease may terminate within twenty-four hours or may remain with the animal for months. The microscopic pathology reveals the same findings found in cases of human encephalitis: petechiæ, lymphocytic infiltration about the vessels, lymphocytic nests, etc., are present in the brain. The infective agent of the disease has been shown to be filtrable.

As previously stated, the inclusion bodies found here were all intranuclear and were discovered only after long investigation, probably because of their peculiar distribution not associated with nerve cells. It was in the endothelial cells of the blood vessels of the brain that they were first demonstrated. One might mention here that this was the first time and the only disease in which inclusions bodies have been found in endothelial cells. Subsequently, inclusions were found in ependymal cells, pia-arachnoid cells, kidney, adrenal and liver. It was in order to determine the general distribution in these organs that this quantitative study was undertaken.

I will mention briefly the general technic of investigation. Two groups of ten animals each were considered; one of experimentally infected foxes and the other of foxes which had acquired the disease naturally. All those selected for the experimental group were injected with virus by puncture into the cisterna magna. Then in every instance, before the sections of these animals were used for study, the microscopic pathology was previously determined as characteristic of encephalitis. Sections of the brain, liver, adrenal and kidney were used. The sections from the brain were selected from the various topographical portions, *i.e.*, frontal, temporal, basal, ganglion, etc. Sections were cut at 8 microns and stained with eosin and hematoxylin. Each section was completely surveyed under oil immersion lens and only definite inclusion bodies were counted and recorded. Then, using a lens and mirror system, magnified images of the various sections were projected and measured by means of a filar-wheel micrometer.

From the area thus gained, from its known depth of 8 microns, and from the standard magnification used, the actual volume in cubic millimeters could readily be calculated. It was then easy to find the number of inclusions per cubic millimeter in each section.

It will only be necessary to mention those results of this investigation that would be most important and mean the most to this group. Approximately 5,000 inclusions were found in each group—natural and experimental. About 75 per cent of these 10,000 inclusions were located in vascular endothelium. This would seem to indicate a certain selectivity in virus diseases for this cell type. In addition to finding inclusion bodies in the endothelial cells of the body, they were at this time discovered to be present in the cells of the pia-arachnoid and hepatic cord cells. As one might expect, the inclusions were more generally distributed throughout the various cell types of the body in the experimental group than in the natural group. That is, the liver, pia-arachnoid and ependymal cells contained more inclusion bodies than the same structures in the natural group. On the other hand, in the natural the inclusions were largely concentrated in the endothelial cells—about 90 per cent appearing there. The pia-arachnoid cells in the experimental group showed a much higher incidence of inclusion body formation than the same cells of the natural group. This, no doubt, is due to their proximity to the point of injection of the virus.

Inclusion bodies were found in the ependymal cells only in the experimental group and here again the direct introduction of the virus into the spinal fluid is undoubtedly the cause. The hepatic cord cells were only slightly affected in both groups and the inclusions found in the kidney were also few and entirely confined to the endothelium of the glomerular capillary loops. In the brain, the topographical parts most affected were the basal ganglion and surrounding areas. All told, about 90 per cent of all the inclusion bodies counted were centered in and about the central nervous system. This bears out very well the general pathology of encephalitis.

It is hoped that this new distribution of inclusion bodies may offer new possibilities in the investigation of human encephalitis.

DISCUSSION

DR. MOSES BARRON (Minneapolis): I would like to ask whether any studies have been made in other diseases of the human similar to the present study, to ascertain what inclusion bodies are present in the cells. He states that the virus was a filtrable virus. Did he study the material to establish that it is a filtrable virus by using the filtrate only from Berkefeld filters, or did he use the macerated tissue?

DR. BARTON: As far as the study of inclusion bodies in the human is concerned, I don't believe there has been a great deal of work done in that line. We have looked over some sections from human encephalitis for inclusion bodies but have not been able to find them. Whether this was due to difference in staining, we do not know. Some one in St. Louis has studied sections taken from humans dead of encephalitis during the recent epidemic there—and claims to have found inclusion bodies in the kidney—but her work is not available for study.

In regard to the filtrate, we took foxes dying on fur ranches, autopsied them, and removed the brain sterilely—saving a piece of it for microscopic study. Under the microscope these sections were diagnosed as encephalitis. Then the sterile brains were macerated in salt solution by use of a homogenizer, centrifuged and supernatant fluid put through a Berkefeld filter. We then injected the filtrate into the cisterna magna of other foxes and reproduced the disease.

DR. BARRON: Have you studied infantile paralysis in the human for these inclusion bodies? It should not be difficult to obtain material for such a study.

DR. BARTON: Some work has been done on that, but no inclusions have been found.

DR. JOHN BROWN (St. Paul): You said, as I recall, that the brain contained a large number of these inclusion bodies. Does that mean they have a selective action for brain cells, or were they found in connective tissue or neuroglia tissue?

DR. BARTON: I referred to the endothelial, pia-arachnoid and ependymal cells in the brain—taking these as a group. We found no nerve cells affected nor any other type of brain cell except the three types mentioned.

R. T. LAVAKE, M.D., *Secretary.*

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

A NEW APPROACH TO DIETETIC THERAPY. Eugene Foldes, M.D., Formerly Assistant Professor of Medicine, University of Budapest, Hungary. 434 pages. Illus. Boston: Gorham Press, 1933.

ROCKEFELLER FOUNDATION ANNUAL REPORT, 1932. 455 pages. Illus. New York: Rockefeller Foundation, 1933.

THE 1933 YEAR BOOK OF GENERAL MEDICINE. 831 pages. Illus. Price, cloth, $3.00. Chicago: Year Book Publishers, 1933.

DIETETICS FOR THE CLINICIAN. Milton Arlanden Bridges, B.S., M.D., F.A.C.P., Associate in Medicine at the New York Post-Graduate Medical School, Columbia University, New York, in collaboration with Ruth Lothrop Gallup, Dietitian. Foreword by Herman O. Mosenthal, A.B., M.D., Director of Medicine at the New York Post-Graduate Medical School, Columbia University, New York. Philadelphia: Lea & Febiger, 1933. Price $6.50 net.

It is intimated in the preface that this book is aimed to meet the needs of the general practitioner and of the hospital interne, without attempting to be expansive, to go into great detail or to be profoundly scientific. The author may be assured that there are few members of the classes for which he writes who will find it necessary to go outside this book for help in feeding the sick or the well. Rather the complaint will be that there is too much, not too little, in these six hundred odd pages.

After a description of the mechanics, physiology, and chemistry of digestion, come the all-important vitamins, to which no undue preponderance is given, a commendable moderation in the face of the manner in which these hidden food principles are thrust forward today. Rather cautiously it is admitted that it may be advisable to make to a generous mixed diet supplementary additions of vitamins B and D.

In the classification of foods there are extensive tables showing the distribution of the various food principles—carbohydrates, proteins, fats, and mineral salts. In passing, it is interesting to note how far down is spinach in the percentage list of vegetables containing iron. The child in the "funnies" who so vigorously condemns the despised vegetable has ground for the refusal, if not for the profanity.

Ruth Lothrop Gallup, dietitian, contributes a most excellent section on food from the culinary standpoint. Too often may be said of food what Dr.

Johnson said to Boswell of the roast beef that was put before them—"it was ill-fed, ill-dressed, ill-cooked, and ill-served." Inadequate cooking for the well is bad enough, but it is unpardonable to bring to the sick, food that is badly chosen, badly cooked, and most unappetizing in its appearance. On trays in private houses, as well as in hospitals, the doctor sees plates swimming in half congealed gravy, with the hot things no longer hot and the cold things lukewarm. This section gives many valuable pointers such as how to prepare and cook vegetables, not forgetting the salt in the water, how to pick out a tender chicken, how to cook bacon in the oven instead of in the frying pan, how to select good meats and how to cook them. It makes one hungry to read her description of foods and their preparation.

More than three-quarters of the book is taken up with the consideration of the special diets for particular diseases, beginning with acidosis and ending with uric acid diathesis. The concluding part is on the feeding of infants and older children. In some of the diseases and conditions that are taken up, diet does not seem to be of first importance, but there can be no question of the prominent place food should be given in Bright's disease, constipation, diarrhea, diabetes, obesity, tuberculosis, typhoid fever, and gastric ulcer. It is to be noted that the author is not averse to using proteins in Bright's disease and that he favors a high caloric diet in typhoid. Probably many typhoid patients are starved today, and those with nephritis get too little meat, eggs, and fish. The combined diets of Gerson, Sauerbruch, and Herrmansdorfer receive marked attention and seem to be acclaimed enthusiastically, although there is a lack of clearness in the text that makes it difficult at times to tell whether some of the claims are made by the above mentioned authors or by Dr. Samuel Ayers, who writes this part.

A few rather striking statements deserve special mention. "There is no doubt that the supplementing of vitamin concentrates to the breast-fed child, without evidence that they are necessary, has been overdone. . . . . It is a common belief among parents that whatever the diet of the child, vitamins should be given irrespective of whether the diet is adequate therein or not. The possible ill-effect of hypovitaminosis is far less than hypervitaminosis." . . . "A cereal diet renders the skin more irritable and a vegetable diet confers a certain degree of immunity against irritants." In Bright's disease "a diet should be aimed at which maintains the patient at a normal weight, that is, does not contain an excess of carbohydrates or fat, contains sufficient protein to maintain the hemoglobin and the red cells at a normal level but not above it, and allows the usual amount of salt and fluids customary in the average diet."

Several foods of a more or less proprietary nature get particular notice, especially Mead's cereal, his dextri-maltose and his lactic acid milk. Klim also is included in many formulas and so is Borden's malted milk. The boom of bananas as a food for children is joined in by this book.

An uncritical examination of Bridges' work finds little to criticize from a literary standpoint. There are some passages that are not very clear, notably a paragraph on page 33 about amines and ptomaines. Some carelessness is evident on page 53 where the statement is made, "Foods as a whole enjoy a two genus classification: those that are nutritive and non-nutritive." While the meaning can be discovered, only one class is mentioned. On the same page: "The classification of nutritive foods is subdivided into: carbohydrates, fats, proteins and mineral salts." Farther on: "Mineral salts and organic acids, although of no caloric or nutritive value, are especially necessary to proper body metabolism." But these slight faults do not prevent this from being a well worth while book.

W. Davis, M.D.

POSSIBILITIES AND NEED FOR DEVELOPMENT OF LEGAL MEDICINE IN THE UNITED STATES. O. T. Schulz (National Research Council Bulletin, October, 1932, No. 87), Washington, D. C., National Research Council, 1932.

Institutes of legal medicine, affiliated with the University system, are an integral part of the ministry of justice in continental Europe. Medical science is impartially applied to the needs of law and justice and for the Court rather than for either party to a legal action.

In the United States the present state of expert medical testimony is unsatisfactory both to medicine and law. It would be difficult to incorporate the continental medicolegal plan into our own government. However, scientific knowledge may be organized and made useful in the administration of justice. This bulletin recommends that in Minnesota a medicolegal service, available to the agencies of justice, be developed within the University by coördination of existing scientific activities and their expansion where necessary.

Royal C. Gray, M.D.

FETAL, NEWBORN AND MATERNAL MORBIDITY AND MORTALITY. A publication of the White House Conference. 486 pages. Illus. $3.00. New York: D. Appleton-Century Co., 1933.

Compiled by a large group of the best known obstetricians of America, this volume deals frankly with a subject to which we can hardly point with pride. Recognizing the tremendous numbers of abortions, premature births, and stillborn which occur, with very little decrease in recent decades, as well as the failure to produce satisfactory reduction in maternal mortality in this country, this report indicates in readable, concise manner, the measures we must adopt to effect improvement. Referring to the constant increase in hospitalization of parturient women, the authors sound this warning note: "This has many decided advantages, but also such disadvantages as exposure to cross infection, and the often false security of the operating room. The latter factor undeniably has led to much unnecessary operating with its resulting trauma and increased morbidity and mortality. The operative rate for confinements amounts to 15 per cent in Scandinavian countries and England; between 65 and 80 per cent in this country, according to 20 answered questionnaires."

Contrary to accepted opinion, the statement is made that tuberculosis in pregnant women, when cases are properly handled, is likely to improve during pregnancy and for a considerable time thereafter.

Excellent statistical studies of the various facts associated with the subjects discussed, help to make this volume an excellent reference book. It deserves a place in the library of anyone interested in obstetrics.

Thomas Myers, M.D.

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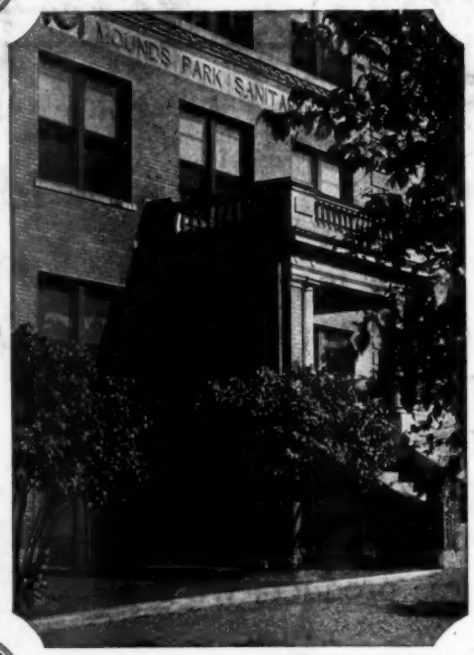

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